

A PICTORIAL SURVEY OF CURRENT PRACTICE, EQUIPMENT AND MATERIALS

Construction Methods

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MARCH, 1945



BEFORE SHIPMENT OVERSEAS all parts of Army trucks and other mobile equipment are carefully checked and serviced at Hampton Roads, Va., Port of Embarkation.

"PROCESSING" by assembly line methods prepares Army equipment for overseas shipment from Hampton Roads Port of Embarkation.

WORLD'S LARGEST AIRPORT has 12-in. concrete runways on dredged sand fill.

SAFETY IN ARC WELDING ... practical advice
by R. F. WYER

Concrete Construction Advanced by Inland Research

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HI-BOND Reinforcing Bars, produced by Inland in response to the demands of leading engineers in Government Bureaus and in private practice, give many important advantages to the construction industry.

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Inland Steel has prepared a booklet "Engineering Tests Prove Bonding Strength of HI-BOND Reinforcing Bar." Your request will bring a copy by return mail. Inland Steel Company, 38 South Dearborn Street, Chicago 3, Illinois. Sales Offices: Cincinnati, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

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CURRENT JOBS ... and Who's Doing Them

BUILDINGS

Public—Navy contract for outside services at White Oak, Md., was awarded to **Harwood-Nebel Construction Co., Inc.**, of Washington, D. C., for \$1,114,000. Chemical pump plant at Memphis, Tenn., will be built by **H. K. Ferguson Co.**, of Cleveland, Ohio, for \$2,200,000. **Austin Co.**, of Cleveland, Ohio, will build \$3,200,000 synthetic tire plant at Tuscaloosa, Ala. Army contract for prefabricated wooden bulkheads of Quonset huts went to **Beaver Cabinet Works**, of Corvallis, Ore., for \$3,000,000. **F. H. McGraw & Co.**, of Hartford, Conn., submitted low bid of \$2,998,447 for buildings at Dearborn, Mich. **Henderson, Black & Greene Co.**, of Troy, Ala., has \$2,500,000 contract for ordnance plant at Talladega. Low bidder on \$2,359,400 family dwelling units at Washington, D. C., is **Harlis Construction Co.**, of Brooklyn, N. Y. Contract for enlarging tire plant at Waco, Tex., went to **Brown & Root**, of Houston, for \$1,600,000. Navy contract for storehouse at Terminal Island, Calif., was awarded to **James I. Barnes Construction Co.**, of Santa Monica, for \$1,420,000. **Anglin-Norcross, Quebec, Ltd.**, of Montreal, has \$1,250,000 contract for storage buildings at Longue Pointe, Que. **Dinwiddie Construction Co.**, of San Francisco, Calif., will build Waves quarters at Balboa Park for \$931,800. Family dwellings at Fleasanton, Calif., will be built for \$846,470 by **G. W. Williams Co.**, of Burlingame.

Industrial—Plant buildings at Wilmington, Calif., will be built by **McNeil Construction Co.**, of Los Angeles, for \$3,000,000. Repair shops at Brainerd, Minn., will be constructed for \$1,500,000 by **A. Johnson Construction Co.**, of Minneapolis. Contract for \$1,000,000 shell plant at Pittsburgh, Pa., was awarded to **Rust Engineering Co.**, of Pittsburgh. Chemical plant at Neville Island, Pa., will be built by **Lummus Co.**, of New York, N. Y., for \$1,000,000.

Commercial—Brick and frame dwellings will be built at Salt Lake City, Utah, by **W. E. Robertson Co.**, of Los Angeles, for \$1,500,000. **Paul W. Trousdale**, of Los Angeles, will build stucco dwellings at Compton, Calif., for \$3,000,000.

HEAVY CONSTRUCTION

Filters for filtration plant at Montreal, Que., will be built by **Atlas Construction Co., Ltd.**, of Montreal, for \$1,439,965. **Brown & Root**, of Houston, Tex., have contract for \$1,138,348 sewer and drainage work at Corpus Christi. Shoulder stabilization at San Diego, Calif., will be built by **R. E. Hazard & Sons**, of San Diego, and **Clyde W. Wood, Inc.**, of Los Angeles, for Navy for \$1,038,670. **Basich Bros. Construction Co.**, of Alhambra, Calif., has \$942,815 contract for airport improvements at Tucson, Ariz. Contract for air station improvements at San Diego, Calif., was awarded to **Kenneth Fraser Co.**, of Pasadena, for \$839,322.

HIGHWAYS

Among recent highway contract awards are the following: Alabama: \$731,959 to **Weymouth Construction Co.**, of Memphis, Tenn.; \$707,552 to **Ziegler Construction Co.**, of Nashville, Tenn.; and \$330,609 to **Wright Contracting Co.**, of Columbus, Ala. Florida: \$363,862 to **L. J. & W. L. Cobb, Inc.**, of Tallahassee. Ohio: \$305,730 to **Vogt & Conant**, of Cleveland. Oklahoma: \$332,826 to **R. R. Twy**, of Oklahoma City; \$276,566 to **M. E. Gillioz**, of Monett, Mo.; and \$259,838 to **Anis Construction Co.**, of Oklahoma City. Washington: \$442,591 to **Erickson Paving Co.**, of Seattle; and \$262,748 to **Strong & McDonald**, of Tacoma. Quebec: \$1,000,000 to **Dufresne Engineering Co.**, of Montreal.

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Construction Methods

A Pictorial Survey of Current Practice, Equipment and Materials

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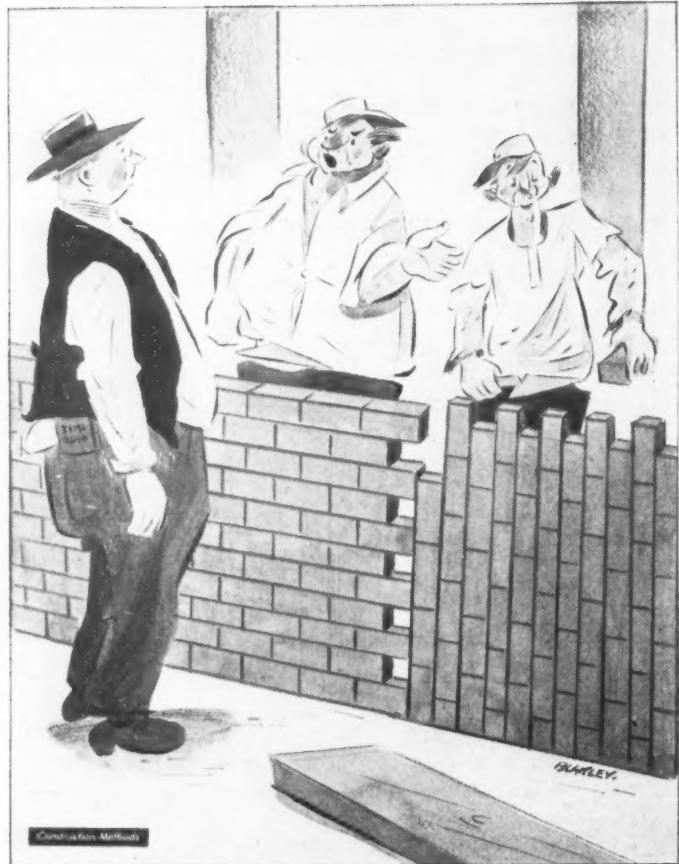
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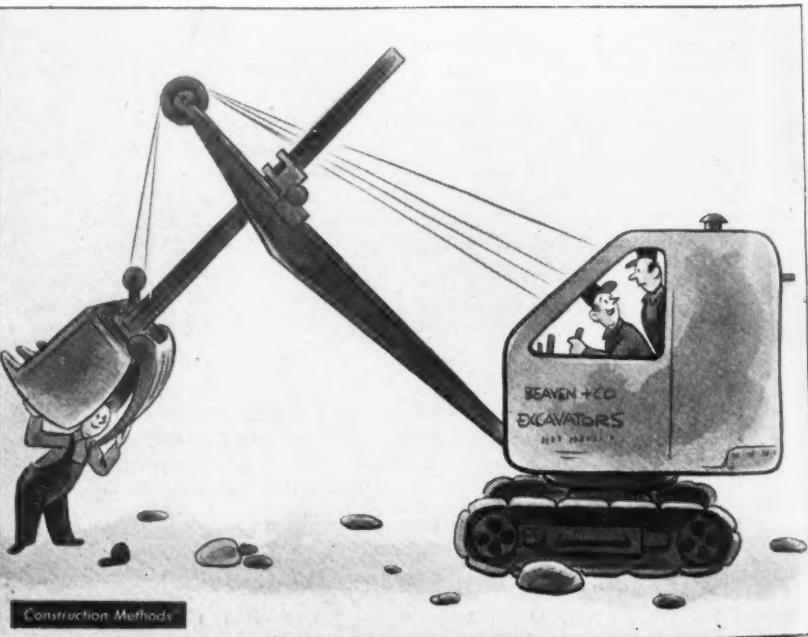
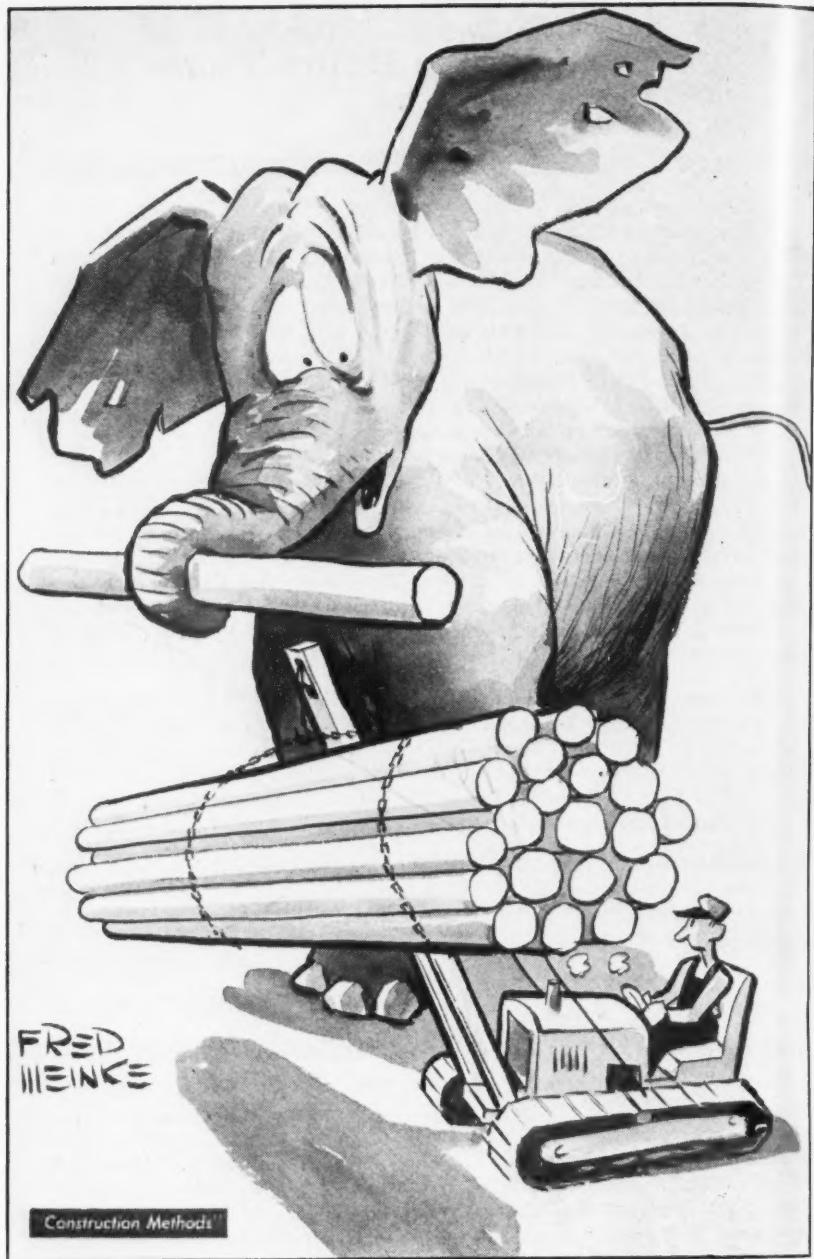
For the benefit of readers concerned with the practical application of method or equipment the following references are to articles or illustrations in this issue that tell:

- How **THREE-NOZZLE FILLER** expedited sealing of paving joints with hot asphalt —p. 63
- How **PRODUCTION-LINE PROCESSING** at port of embarkation prepared trucks and heavy-duty mobile equipment for overseas shipment —p. 66
- How **RUST PREVENTIVE** was sprayed on undercarriage and all other vulnerable places on vehicle —p. 68
- How **ENGINE HOODS** were sealed with waterproof paper and non-hygrosopic tape —p. 70
- How **WORLD'S LARGEST AIRPORT** is being constructed with 12-in. concrete runways on dredged sand fill —p. 72
- How **TRANSVERSE BLADING SPREADER** distributed concrete across 12½-ft. runway lane and struck it off to 8-in. depth —p. 74
- How **TRACTOR-SCRAPER COMBINATIONS** were loaded by snatch method —p. 77
- How **BUCKET HOIST** insured straight lift of buckets to working platforms without contact with structure —p. 80
- How **OXYACETYLENE FLAME** was used to remove scale from steel girder prior to painting —p. 80
- How **REINFORCING WIRES IN CONCRETE** were electrically prestressed —p. 81
- How **PROTECTIVE DUGOUT** was built for plane at French airfield —p. 82
- How **SAFETY IN ARC WELDING** can be insured —p. 84
- How **FORE AND AFT PEAKS** of C-1 cargo and passenger ships were assembled in sections —p. 86
- How **HAWSE PIPE** was welded to inboard side of hull, requiring up to 14 passes —p. 89
- How **BAILEY BRIDGE** of 140-ft. span was cantilevered to place in Italy —p. 91

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"Ed's ambition is to become a lion tamer!"



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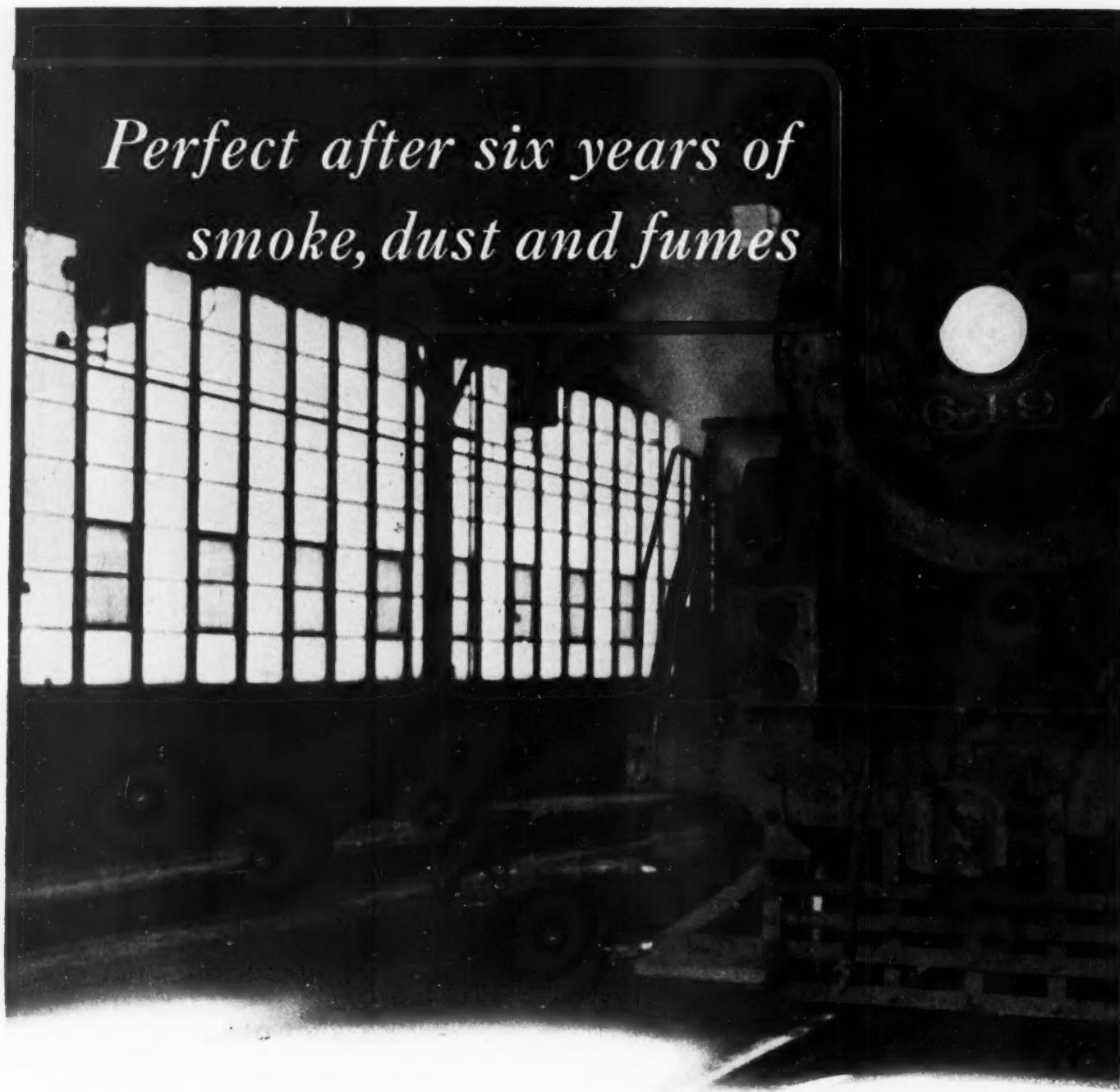


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For EARTH ROCK COAL ORE



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CM-H-69



How the B. F. Goodrich "shock shield" increases tire life and bruise resistance

OFF-THE-ROAD tires unavoidably hit rocks, ruts, and other obstructions under tons of impact. Those shocks bruise tires and often cause blow-outs, loss of time, costly repair bills, perhaps a ruined tire.

To give tires and tire users increased protection against such damage, B. F. Goodrich engineers developed a new tire construction principle . . . the *shock shield*.

Between the tread and the plies are four breakers, layers of rubber-coated rayon cords, insulated with thick cushions of shock-resisting rubber—the *shock shield*. These breakers are in pairs (see A), with the cords in each pair running parallel to each other—but with each pair running in opposite directions to give balanced strength. When the tire hits ruts, stones, etc., the cords in these breakers stretch

together—not across each other—and return to their original positions. There is no friction between them, yet the force of the blow is distributed—not concentrated—and is absorbed by the insulating rubber cushions (see B). Thus, the shock passed on to the cord body of the tire is greatly reduced.

Users report results

Users of B. F. Goodrich off-the-road tires report they get fewer bruises, far less separation, better service, and longer wear—final proof of the soundness of BFG tire construction principles.

One operator reports 17,226 miles from B. F. Goodrich tires compared with 12,501 for the best of all three ordinary tires used; another, 15,107 miles compared to 11,304 for the best ordinary tire; still another, 17,599 miles compared to 6,476 for the best ordinary tire. A strip mine operator

reports an average of over 4000 hours of service for B. F. Goodrich Universal tires compared to 1600 hours from another make.

Make your own test

We urge every user of off-the-road equipment to try B. F. Goodrich tires alongside of other makes. Keep accurate service records. Compare natural rubber tires with natural rubber, synthetic with synthetic, and prove to yourself that you can save money with B. F. Goodrich tires.

Supplies of most off-the-road tires are limited. Place tentative orders early. See the local B. F. Goodrich dealer for information, or write us direct. *The B. F. Goodrich Company, Akron, Ohio.*

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In war or peace
B.F. Goodrich
FIRST IN RUBBER



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*no wonder they call it
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The Right Explosive Fits the Job Like a Key Fits a Lock



Choosing the right explosive is like picking out the right key to open a lock.

In a key, it's a matter of having the right combination of notches.

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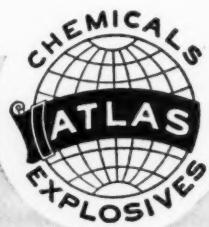
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KEEP YOUR JOBS

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Thor automatically lubricated sump pumps are designed and manufactured to operate most efficiently on the toughest jobs under the most unfavorable conditions. The Thor rotary air motor is enclosed in an airtight, foolproof housing to assure steady operation whether partially or fully submerged. Because of their self-priming, centrifugal impeller type construction, Thor sump pumps will operate in the dirtiest of water—in oil—in sludge or in sewerage, at peak efficiency. For the best in sump pumps call your nearby Thor distributor today.

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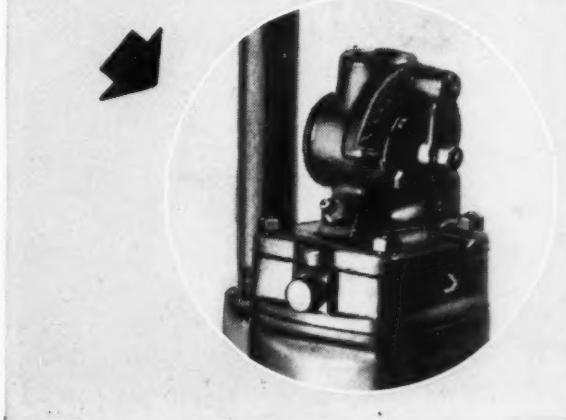
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AUTOMATIC LUBRICATION

Thor pumps are equipped with a highly efficient automatic lubrication system. The oil is fed from a built-in oil reservoir to the rotor blades and the cylinder bushings in a fine continuous spray. Live air pressure provides continuous application of grease to the impeller hub and bushing.

VARIABLE SPEED CONTROL

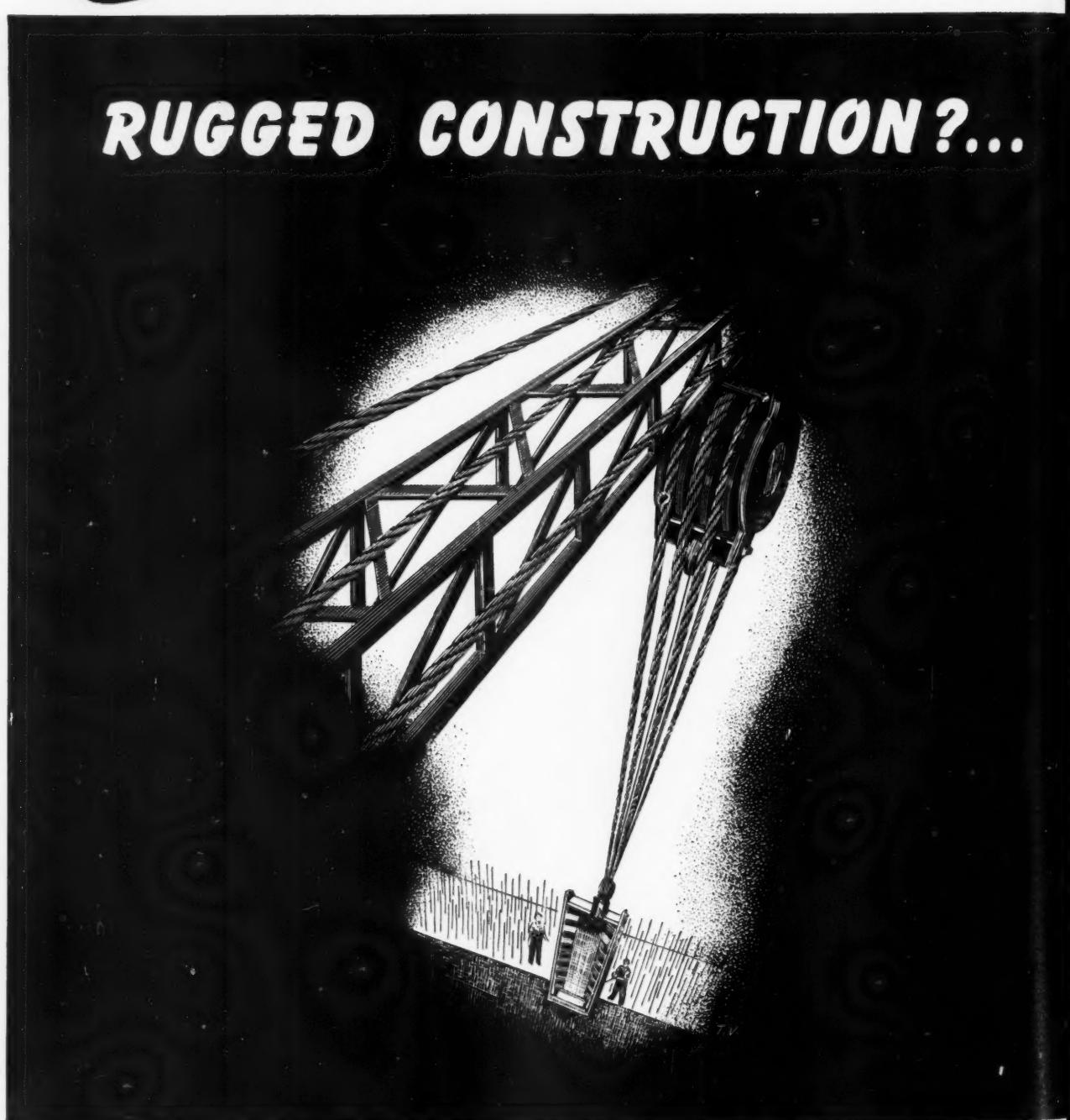
The Thor variable speed throttle accurately controls the speed and capacity of the pump. This is a hand lever that can be set to pump up to 244 gallons per minute at 90 lbs. air pressure, or to idling speed where it pumps slowly.





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RUGGED CONSTRUCTION?...



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CHOOSE WIRE ROPE FOR THE LONG PULL!

NO TIME to "Baby" your equipment when you've got to keep a heavy flow of construction materials moving at a fast clip. And whether it's shovel or hoist, crane or dragline—efficiency depends on wire rope that has the capacity to *deliver...day in and day out*. That's why, when the heat's on to meet construction schedules, you can have confidence in Roebling "Blue Center" Wire Rope...and its all-around, built-in quality.

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PACEMAKER IN WIRE PRODUCTS



**QUESTIONS
AND
ANSWERS**

Q What is meant by the designations of 6x7, 6x19, 8x19, and 6x37 rope?

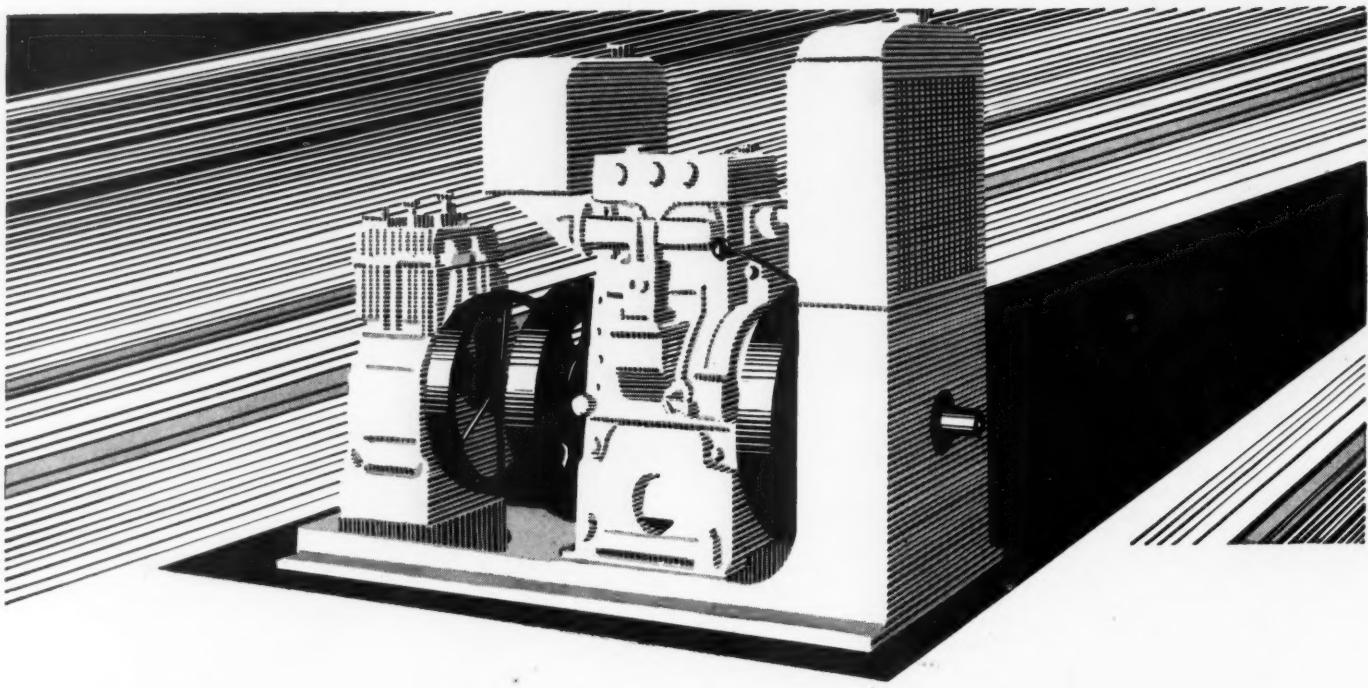
A Each of the above designate a particular group or classification of wire rope: the 6x7 rope contains 6 strands of 7 wires each, whereas the 6x19 rope contains 6 strands with from 16 to 25 wires per strand. The 8x19 rope contains 8 strands with from 16 to 25 wires per strand, while the 6x37 rope contains 6 strands having from 26 to 46 wires per strand.

Q How do the above groups or classifications of ropes compare as to abrasion resistance and flexibility?

A The 6x7, 6x19, 8x19 and 6x37 ropes are rated as listed with respect to abrasion resistance, the 6x7 having the greatest resistance to abrasion. The flexibility of these ropes follow in the same order with the 6x7 having the least flexibility.

Q Why are so many different constructions of wire rope used?

A Since practically every type of installation on which wire rope is used is either dissimilar with respect to equipment or operation, a good number of different constructions of rope are necessary to obtain maximum rope service.



Chrome-lined Donkey-engine

The donkey-engine, though small, is a "man of all work" . . . on shipboard, in the mine, on construction jobs, in the oil fields and even on farms. Wherever there are tough jobs to do, we find the donkey-engine doing them.

Plain in appearance and with no fancy trim, these sturdy little work engines are nevertheless becoming large users of chromium, the modern decorative metal. But the donkey-engines don't use chromium for decoration, unless it is a "decoration" for greater reliability and lower maintenance cost. For the chromium they use is inside the cylinder . . . a chrome-lining . . . PORUS-KROME.

PORUS-KROME is hard, pure chromium which is applied to cylinder bores by the patented Van der Horst process. It has tiny pores and channels in its surface which serve as reservoirs

for lubricating oil, feeding it back to the surface as needed. It reduces corrosion and wear and multiplies cylinder life 4 to 20 times, and ring life 3 to 4 times.

Every type of heavy-duty engine needs and uses PORUS-KROME . . . bus, truck, tractor, locomotive, marine, stationary power plants . . . large and small . . . even donkey-engines.

You would expect that anything as good as PORUS-KROME would be used by the Army and Navy. It is . . . in engines for submarines, destroyer escorts, mine sweepers, landing craft, tanks and airplanes. Right now, the entire production of the three Van der Horst plants is devoted to this work.

But someday soon, you too, can have PORUS-KROME. In the meantime, why not investigate the advantages PORUS-KROME will give your engines?

PORUS - KROME



Good for the Life of your Engines



VAN DER HORST CORPORATION OF AMERICA OLEAN • NEW YORK
CLEVELAND 11 • OHIO

AN AFFILIATE OF DRESSER INDUSTRIES

BUILD BETTER Superhighways

High cost of materials no longer is a vital factor influencing the construction of the superhighways that will keep the nation's roads far ahead of traffic needs. Iowa has developed a complete line of equipment that achieves large volume production at lowest possible cost by skillfully taking advantage of all the factors influencing maximum and uniform production.

The Cedarapids Morok plant, for example, is an all-portable, super quarry that handles material in a continuous flow from quarried rock to delivery trucks

... with Aggregate from the
Cedarapids Morok ...

in one operation. The big primary will take any rock that will pass through the bottom of a 1½-yard shovel. Production averages 150 to 200 tons of crushed rock per hour. The plant can be easily moved to other quarry locations as jobs change. Your only competition will be another Morok. Your only

If your aggregate is not ready for asphalt mixing equipment is not ready for coming postwar construction jobs, now is the time for you to improve your bidding position for production and profits. We invite you to investigate Cedarapids equipment.

IOWA MANUFACTURING COMPANY
CEDAR RAPIDS, IOWA



Cedarapids

Built by
IOWA

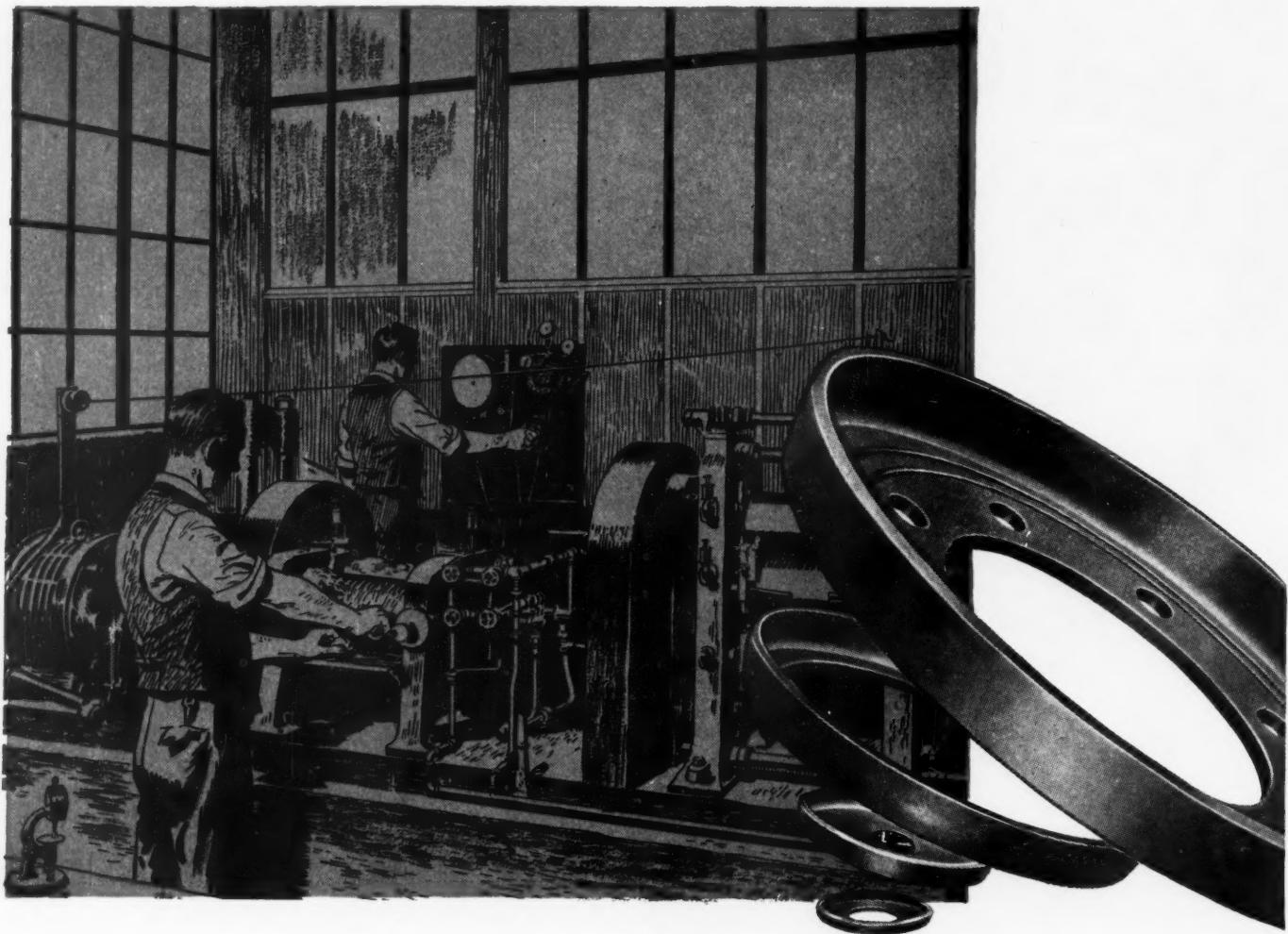
ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS—STEEL BINS
VIBRATOR AND REVOLVING
SCREENS

BUCKET ELEVATORS
STRAIGHT LINE ROCK AND
GRAVEL PLANTS
FEEDERS—TRAPS

THE IOWA LINE of Material Handling Equipment Includes

PORTABLE POWER CONVEYORS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX)
PLANTS

PORTABLE STONE PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS



**They taught Oil and Rubber to
GET ALONG and made a better piston packing cup**

The wide range of service conditions that piston packing cups must meet in industry calls for something special in service qualities. Wabco packing *has* these qualities—thanks to Westinghouse research activities.

Various materials were investigated in an extended search for the best packing material. Rubber had the greatest promise, but it couldn't stand oil. The Research Department kept digging, and finally came up with a formula that could live with lubricants and still retain its resilience, mechanical strength and sealing properties under severe service conditions.

In addition to these service qualities, Wabco packing offers an important exclusive mechanical feature. Built-in limited compression, available in cups

from 1-inch to 7½-inch, assures low friction.

Wabco packing cups are available in sizes from ¾-inch to 30-inch, for original installation in pneumatic cylinders; from 1¾-inch to 7-inch for hydraulic cylinders. If your product includes such cylinders, you will find Wabco cups an economical, simple, and dependable solution of your packing problems.

**WESTINGHOUSE AIR BRAKE COMPANY
INDUSTRIAL DIVISION**

General Offices:
WILMERDING, PA.



More Loads per Day!

MORE OPERATING DAYS PER MONTH!

Servo-type self energizing brakes.

Outside clutches and brakes for accessibility. Self-ventilated for cooler operation.

Cable load is taken directly from drum to housing thru tapered roller bearings.

All gears are spur-type requiring minimum of adjustment.

Sturdy steel housing prevents excessive distortion of parts. Provides lubrication chamber for entire unit.



GAR WOOD Cable CONTROL UNITS

Gar Wood Cable Control Units are engineered and constructed to give unsurpassed performance, under the toughest conditions, with a minimum of "down time" for adjustments. Special emphasis is placed on sturdiness to avoid excessive distortion of case and parts. Every minute detail of this smooth-running unit has plenty of trial and proof back of it. Remember that Gar Wood is the world's largest manufacturer of winches, with years and years of experience. You'll get MORE out of your machines (regardless of make) with a Gar Wood Cable Control Unit. That's not only our claim . . . ask any user.



GW ROAD MACHINERY
is Sold Through
ALLIS-CHALMERS
Dealers Everywhere

ROAD MACHINERY DIVISION

GAR WOOD INDUSTRIES, Inc.
DETROIT 11, MICHIGAN

OTHER PRODUCTS OF GAR WOOD INDUSTRIES INCLUDE HOISTS AND BODIES • WINCHES AND CRANES • TANKS • HEATING EQUIPMENT • MOTOR BOATS

Building a B-29



TEXACO

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON SUNDAY NIGHTS METR

base in 158 days



WORKING under enemy fire, Army engineers began converting Saipan into a B-29 base on D-day plus 5. Only 158 days later, Superfortresses took off for their first Tokyo raid. Using swarms of bulldozers and shovels — part of the 9,000 tons of construction equipment brought ashore — coral for surfacing runways was quarried and delivered on a round-the-clock schedule *one truckload every 40 seconds!*

Whether used on the fighting fronts or the home front, efficient, trouble-free performance of construction equipment depends on effective lubrication. That is why experienced contractors everywhere use Texaco.

Texaco Marfak, for example, used in your tractors, shovels, bulldozers, trucks, etc., provides ideal film lubrication inside a bearing yet maintains its original consistency at the outer edges . . . sealing itself in, sealing out sand, dirt, water. Its tough adhesive film cushions bearings against road shocks. Makes parts last longer.

For wheel bearings, use *Texaco Marfak Heavy Duty*. It stays in the bearings — off the brakes. Seasonal repacking is no longer required.

Texaco lubricants have proved so effective in service they are definitely preferred in many fields, a few of which are listed below.

Texaco Lubrication Engineering Service is available to you through more than 2300 Texaco distributing points in the 48 States. The Texas Company, 135 East 42nd Street, New York 17, N. Y.

THEY PREFER TEXACO

★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with

Texaco than with all other brands combined.

★ More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

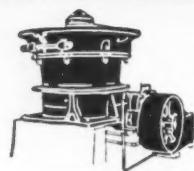
Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

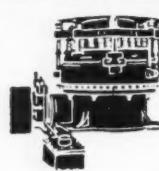
HTS METROPOLITAN OPERA BROADCASTS SATURDAY AFTERNOONS



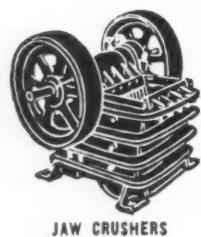
*Where will
YOUR plant
fit in the
postwar
picture?*



PRIMARY BREAKERS



GYRASPHERE SECONDARY CRUSHERS

BELT AND
BUCKET ELEVATORS

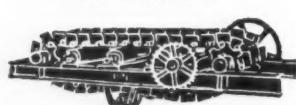
JAW CRUSHERS



SAND CLASSIFIERS



PULSATR VIBRATING SCREENS



HEAVY DUTY FEEDERS

As an aggregate producer, you are facing the postwar prospect of rigid specifications, finer sizing requirements and far keener competition than ever before.

Is your plant and its equipment adequate to serve postwar construction market demands—at a profit?

Start your modernization plans now. Get ready for quick reconversion. Build in new plant efficiency with Telsmith Equipment.

By replacing worn out, obsolete or inadequate units with the right Telsmith machinery you can eliminate roundabout methods of

handling and bottle-necks in the flow of materials. Telsmith's greater flexibility insures wider product diversification. Telsmith's speedier, smoother, trouble-free operation and greater capacity will step up your production. And Telsmith's lower power and up-keep requirements will cut down your costs.

Telsmith expert engineering help is at your disposal, whether you plan to expand, modernize or build a complete new sand and gravel or rock crushing plant. Consultation involves no obligation. Get Bulletin E-10.

TELSMITH

Equipment

FOR SAND, GRAVEL, ROCK CRUSHING PLANTS

E-7

SMITH ENGINEERING WORKS, 510 EAST CAPITOL DRIVE, MILWAUKEE, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

51 East 42nd St.
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Milwaukee 3, Wis.

Boehck Eqpt. Co.
San Francisco 4—Los Angeles 14

Brandeis M. & S. Co.
Louisville 8, Ky.

Rish Equipment Co.
Charleston 22, & Clarksburg, W. Va.

Rish Equipment Co.
Roanoke 7, & Richmond 10, Va.

North Carolina Eqpt. Co.
Raleigh and Charlotte 1, N.C.

Mines Eng. & Eqpt. Co.
Wilson-Weesner-Wilkinson Co.
Knoxville 8, & Nashville 6, Tenn.

13 TOURNAPULLS LICK LONG ISLAND SAND

For Circle Construction Corp.
On New York City Idlewild Airport



Circle Construction Corporation has assigned the toughest 2,000,000 cu. yds. of their 2,500,000-yard Idlewild Airport contract to their LeTourneau fleet, including 13 Super C Tournapulls. Conditions are severe. Sand ranges from saturated, ocean-dredged material to extremely dry, loose footing that bogged down ordinary rubber-tired equipment.

Under these extreme conditions the big rubber-tired Tournapulls, with their 12 pay yard Scraper loads, show an over-all operating efficiency from 85 to 90%. This, in spite of loose sand, so tough in some places, that the Tournapulls are occasionally pushed off the fill to keep these rigs in production where other hauling units failed to get through.

Big 5'6" diameter tires, 21" wide, provide ample flotation. Two-wheel design, concentrating full weight of the prime mover and 40% of the Scraper and its load on the front drive tires, gives maximum traction . . . proved Tournapulls to be the answer on this tough Long Island sand job.

Time Studies

Working in dredged ocean sand, **TOURNAPULLS** show overall efficiency performance of 85 to 90% on both medium and long hauls:

Round Trip Haul	5200'	7200'	8400'
Average Loads per Hour.....	7.0	5.8	5.5
Pay Yards per Trip.....	12	12	12
Pay Yards Per Hour.....	84	69.6	66
Pay Yards per 10 Hours.....	840	696	660

You'll Make More Money with Tournapulls

Like Circle Construction Corporation, and scores of other leading contractors, you'll find, too, that fast-moving, rubber-tired Tournapulls will give you higher average speed to move more yardage at lower costs on a wide range of conditions. It will pay you to check NOW on Tournapull performance, when figuring your airport, roadwork, dam, levee, stripping and other earth construction jobs. See your local LeTourneau distributor about the profit possibilities TODAY.

↑ In this difficult dredged Long Island sand, Tournapulls often heap full loads in only 45 seconds, average less than a minute for loading. Engineers' fill measurements show Tournapull loads check out slightly over 12 yards pay dirt.



↑ Quick acceleration into 14.9 m.p.h. speed gave remarkably high percentage of Tournapull travel time in high gear to deliver big yardages over varying haul lengths (see time studies). This, in spite of both extremely wet and dry hauling conditions.

↓ Big 5'6" tires, 21" wide, kept the Tournapulls rolling on top of the sand fill to spread their loads in an average of one minute.

c6

LETOURNEAU
PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

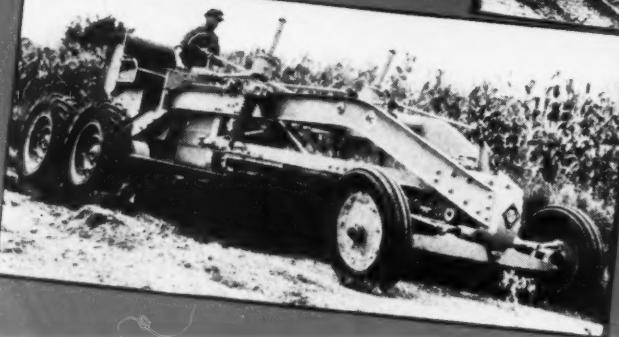


TOURNAPULLS

* Trade Mark Reg. U. S. Pat. Off.

RUBBER-TIRED POWER FOR FASTER EARTHMOVING

THEY ALL DO MORE ON Firestone



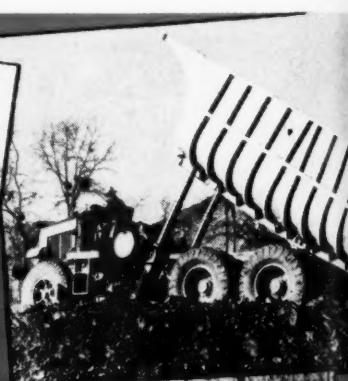
EVERY contractor knows that profits depend upon completing each job with the lowest possible expense. That calls for power-driven equipment mounted on Firestone tires.

Big, tough and rugged, these tires are built specifically for the job of making modern earth-moving equipment more profitable.

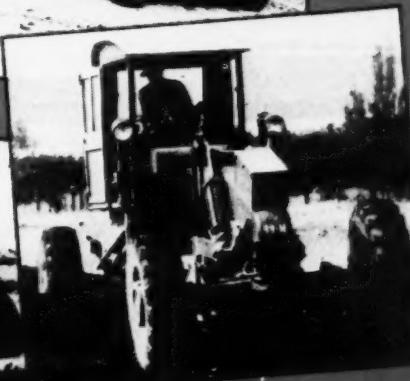
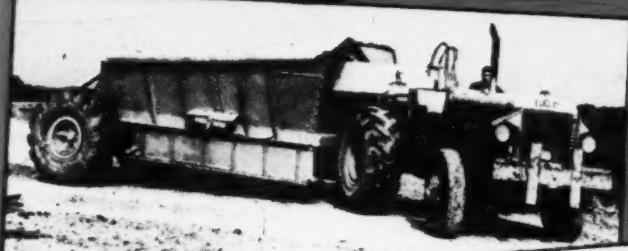
Unexcelled for strength and quality, Firestone tires stay on the job longer, on all machines . . . under all conditions. That's why you can depend on them to increase the operating efficiency of your equipment.

For the best in music, listen to the "Voice of Firestone" with Richard Crooks and Gladys Swarthout and the Firestone Symphony Orchestra conducted by Howard Barlow every Monday evening over NBC network.

Copyright, 1945, The Firestone Tire & Rubber Co.



REWORK AT LOWER COST OFF-THE-HIGHWAY TIRES

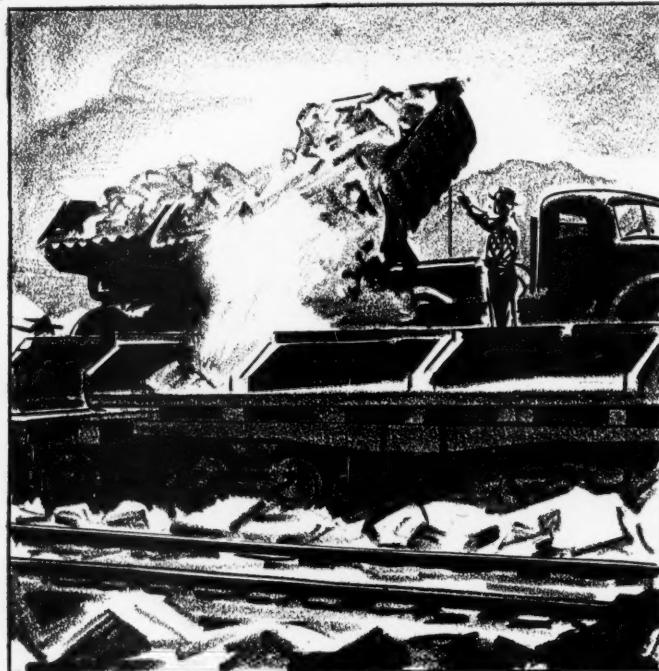


Do you know that . . .

AMERICAN AIRLINES INC. UNDER CONTRACT TO THE AIR TRANSPORT COMMAND HAS MADE MORE THAN 4300 TRANSATLANTIC CROSSINGS . . . FOR LUBRICATION OF ITS GREAT FLAGSHIP FLEET, AMERICAN USES SINCLAIR PENNSYLVANIA MOTOR OIL.



CRUDE OIL AND FINISHED PRODUCTS TRANSPORTED DAILY THROUGH THE SINCLAIR PIPELINE SYSTEM WOULD FILL 318,400 55-GALLON DRUMS. THESE, STACKED END ON END WOULD BE 31 TIMES HIGHER THAN MT. EVEREST. SINCLAIR USES OLDEST CRUDES TO MAKE HIGHEST QUALITY LUBRICANTS.



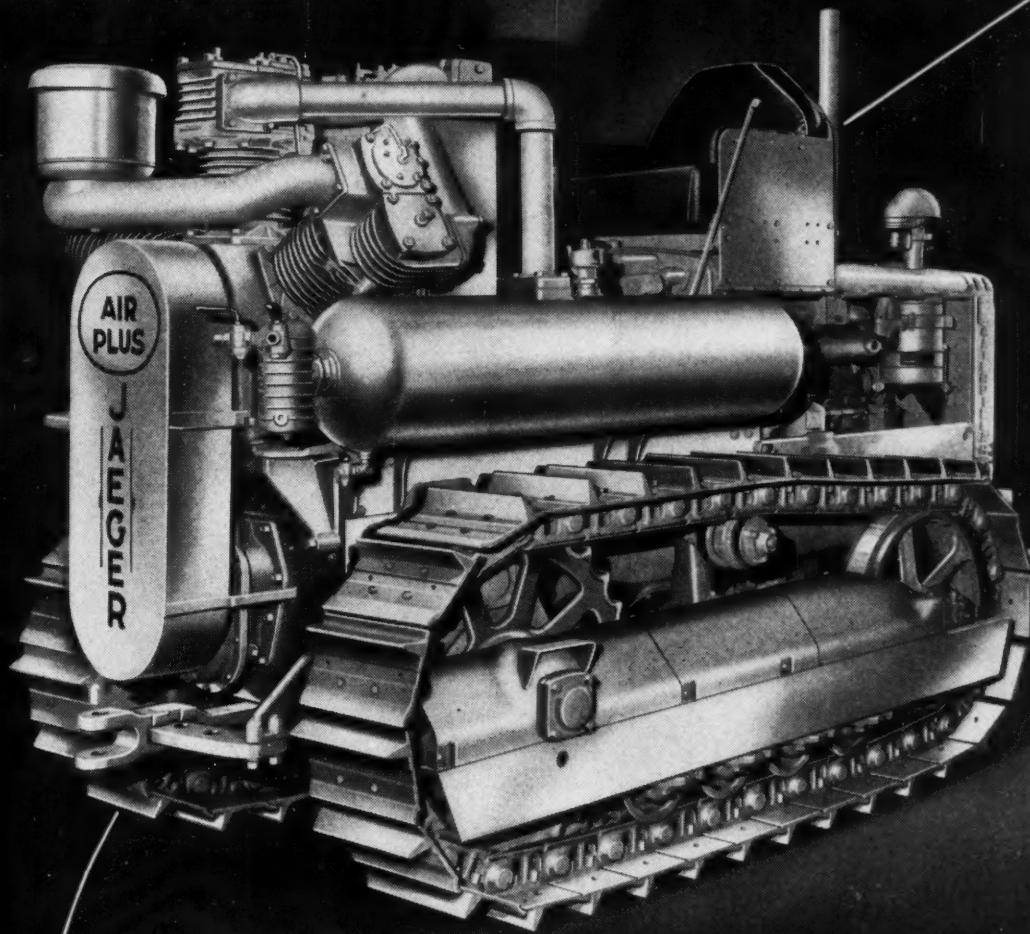
PROTECTION AGAINST EXCESSIVE WEAR AND SHOCK LAY-UPS IS PROVIDED FOR HARD-WORKED EQUIPMENT BY SINCLAIR SPECIALIZED MOTOR OILS AND GREASES. TEN-OL 200 IS A NEW OIL FOR BETTER LUBRICATION OF DIESEL-POWERED EQUIPMENT.

SINCLAIR
IS EQUIPPED TO SERVE YOU BETTER!

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N.Y.

AIR
PLUS

JAEGER COMPRESSOR



"TRAVEL-AIR"—tractor mounted and powered compressor for pioneer road building, advance engineering work and the rugged conditions of railroad and oil field construction.

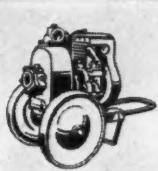
Designed specifically for Caterpillar and International Tractors and force feed lubricated, it can work in any position the tractor takes. Available in 160 to 315 ft. sizes with all attachments and installation blueprints. "TRAVEL-AIR" is one of the many advancements presented in a complete catalog of Jaeger "AIR PLUS" Compressors, just off the press. Ask for your copy. THE JAEGER MACHINE COMPANY, 000 Dublin Avenue, Columbus 16, Ohio.



"FLEET-FOOT"
Crane-Loaders



"SPEEDLINE"
Concrete Mixers



"SURE PRIME"
Contractors Pumps

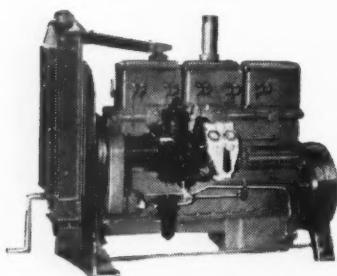
JAEGER
Engineered EQUIPMENT

JAEGER-LAKWOOD SPREADERS, FINISHERS AND BITUMINOUS
PAVERS, FORMS, FORM TAMPERS—"DUAL-MIX" TRUCK MIXERS,
AGITATORS—JAEGER HOISTING ENGINES, TOWERS



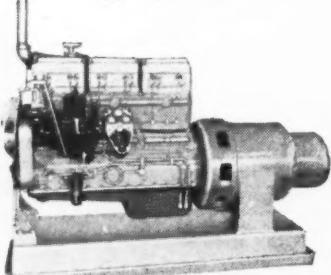
Model H Cummins Diesel is offered in both four and six-cylinder arrangements, developing maximum output of 100 and 150 hp., respectively. This engine is manufactured in a complete line of industrial and automotive models, such as the Model HP-600 power unit, shown above, and Model HBI-600, right, for wheel or track-mounted equipment.

☆ ☆ ☆



The Model HIP-600 is an open type power unit incorporating the same basic engine as that described above. It has a $4\frac{7}{8}$ " bore and 6" stroke, the six-cylinder unit having a piston displacement of 672 cu. in., and the four-cylinder, 448 cu. in.

☆ ☆ ☆

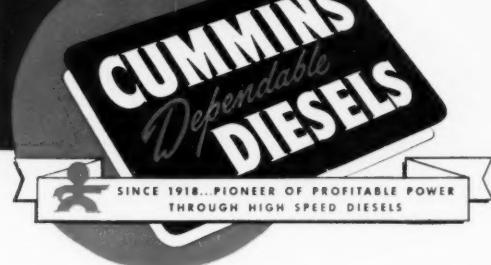


The Model HGA-601 is an AC generating set, rated 50 kw. at 1200 rpm. The four-cylinder Model H generating set is rated 30 kw. at 1200 rpm. Both four and six-cylinder sets are also available for DC operations.



A look at the Cummins Diesel's long record of profitable performance in all types of heavy-duty earth moving and material handling equipment proves that—in the construction and aggregates industries—one diesel does the complete job! In trucks, shovels, compressors, rock crushers, dredges and virtually every other type of equipment—rugged, flexible, economical Cummins Diesel power has consistently demonstrated its ability to get the job done in less time . . . at a lower cost.

CUMMINS ENGINE COMPANY, INC., Columbus, Indiana.



*the
906-*

Laying 103,500 cu. yd. of
concrete in a hurry

the Equipment

Three Multi Foote
34 E Pavers

BUILDING one of the longest and best constructed airport runways in the country, 8500 feet long, 200 feet wide, and 12 inches thick, and laying other necessary surfacing for handling 175,000-lb. wheel loads for a total of 103,500 cu. yd. of concrete is one of the more recent jobs finished in record time by three Multi Foote 34 E Pavers. The average concrete production was 1560 cu. yd. for a ten hour shift, with a high day of 2258 cu. yd.

Records like this for paving airports and roads are everyday production for Multi Foote Pavers because every feature is built for better mixing and faster charging and discharging. Double cone drum with its end-to-end scouring action insures a complete and thorough mix of every batch. Rotary discharge takes only a quarter turn to pour concrete into the big bucket ready to speed out the long boom to be discharged. One of the most important features of every Multi Foote is the high operating platform which provides greater visibility for faster, more accurate work.

Write direct or ask your Foote dealer for details.

THE FOOTE CO., INC.

1910 State Street, Nunda, N. Y.



MULTI~~FOOTE~~ **CONCRETE PAVERS**



Athey Force-Feed Loader removing sod and earth left in windrows by Motor Grader on maintenance operations on a State Highway.

ROAD REPAIR CREW... 1945 STYLE!



THOUSANDS of miles of war-worn highways are scheduled to get high-priority attention during 1945. Highway maintenance, repairs and rebuilding are being given the "go ahead" as war-urgent projects. To help in relieving manpower shortages, and to speed highway maintenance jobs, Athey Force-Feed Loaders are in great demand by highway departments and engineers throughout the country. These loaders, working as companion tools with the "Caterpillar" Motor Grader, pick up and load windrowed material from road surfaces faster and cleaner than previous methods. They are a fast-working companion tool with the Motor Grader for road widening, ditch cleaning, slope trimming, loading oil mix material, salvaging road surface material and other highway maintenance operations. Athey Force-Feed Loaders load sod, earth, rock, sand, oil mix, trash and other materials better, quicker and cheaper. Get full facts now on this revolutionary loading machine. Ask your Athey-Caterpillar Dealer for further information, or write to Athey Truss Wheel Co., 5631 West 65th Street, Chicago 38, Illinois.

DEPENDABLE LOADING AND HAULING EQUIPMENT



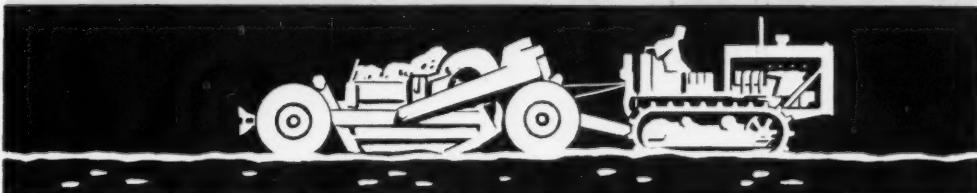
Athey

ZONE YOUR EQUIPMENT

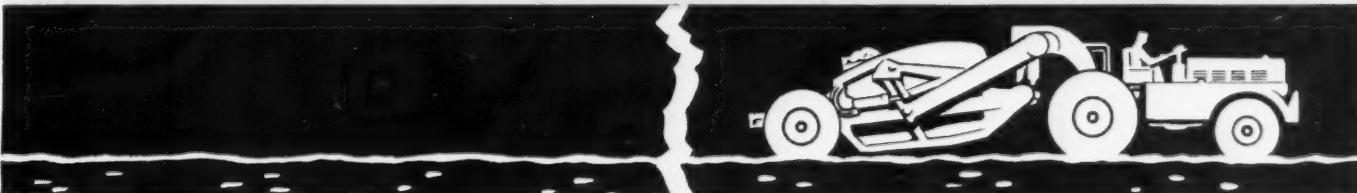
FOR LOWEST COSTS
ON EARTH



ZONE 1 "Caterpillar" Diesel track-type Tractors, with bulldozers and rippers



ZONE 2 "Caterpillar" Diesel track-type Tractors, for loading and pulling scrapers



ZONE 3 "Caterpillar" Diesel wheel-type Tractors, for high-speed hauls

MOST big contracts today call for a variety of equipment. A bulldozer, for instance, is your number one work tool. But you wouldn't attempt to do the whole job with bulldozers.

TAKE tractor-scrapers, too. In bidding on a big job, there are many factors to be weighed. How long will the hauls be? What kinds of material have to be handled? What is the total yardage? Are there stiff grades to climb? What shape are the haul roads in? And how fast must the job be done to avoid penalties?

Tracks? Rubber? Or Both? All the way from chunking out the right-of-way to finishing the

grade, track-type tractors are indispensable on a large part of any earthmoving job. And there is a definite place for rubber tires, as well. Their greatest usefulness is on longer hauls, over good haul roads. To get the job done efficiently, on time, and at lowest cost per yard, you need *both* track-type and wheel tractors.

"Caterpillar" Job Analysis. Your "Caterpillar" dealer knows earthmoving costs, and he knows machines. Because he sells both kinds of "Caterpillar" Diesel Tractors—tracks and rubber—his judgment of your problem is fair and unbiased.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.



ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

SAVES TIME

New Socony-Vacuum Lubrication
Service—designed especially for the
Contracting Business—Brings You
these great advantages!



SOCONY-VACUUM
Contractor's Lubrication
SERVICE

TUNE IN "INFORMATION PLEASE"—MONDAY EVENINGS, 9:30 E.W.T.—NBC

MANY WAYS

WITH the lubricants you buy, are you getting the kind of service that helps you beat contract dates?

Compare and see if Socony-Vacuum doesn't offer more benefits—on the job—in your maintenance work—wherever you need practical time-saving help.

No matter how varied your equipment, you get precisely the right oil or grease for every application. This means maximum protection for hard-to-replace parts without the bother of special orders.

Our complete line of top-quality lubricants—PLUS regular on-the-job delivery service—saves interruptions... reduces inventory problems, cuts costs.

Your Socony-Vacuum Representative is always ready to work with your crews in making a careful

analysis of time-losing problems. He'll supply you with field-tested maintenance schedules and cost-cutting ideas adapted to your individual needs—provide qualified engineering help and other practical aids.

Instead of merely getting fuels and lubricants, you get complete on-the-job service when you buy Socony-Vacuum products.

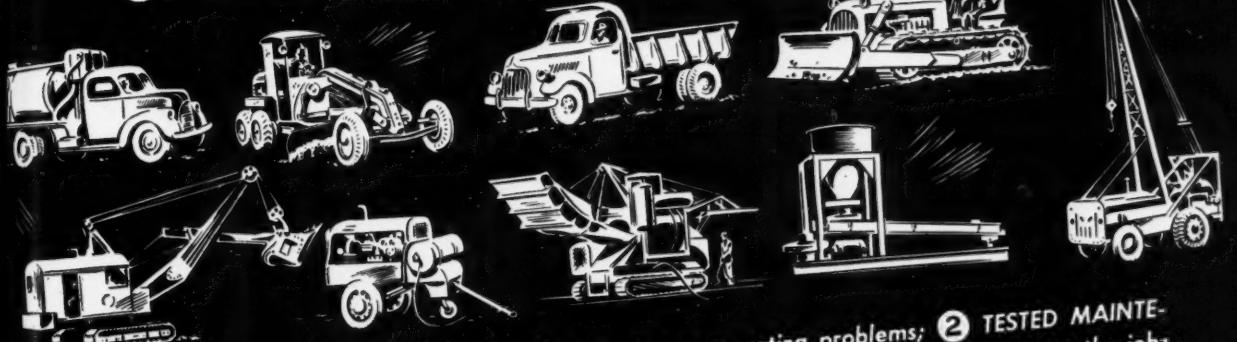
"ON YOUR STAFF—BUT NOT YOUR PAYROLL"—

Your Socony-Vacuum Representative



SOCONY-VACUUM OIL CO., INC., and Affiliates:
Magnolia Petroleum Co., General Petroleum Corp. of Calif.

CORRECT LUBRICATION FOR EVERY PART OF EVERY MACHINE YOU OPERATE ...



PLUS

- ① ENGINEERING HELP on time-losing operating problems;
- ② TESTED MAINTENANCE SCHEDULES that minimize service man-hours—keep equipment on the job;
- ③ PROMPT, DEPENDABLE DELIVERY—a reliable, on-the-job service that eliminates inventory problems for you!

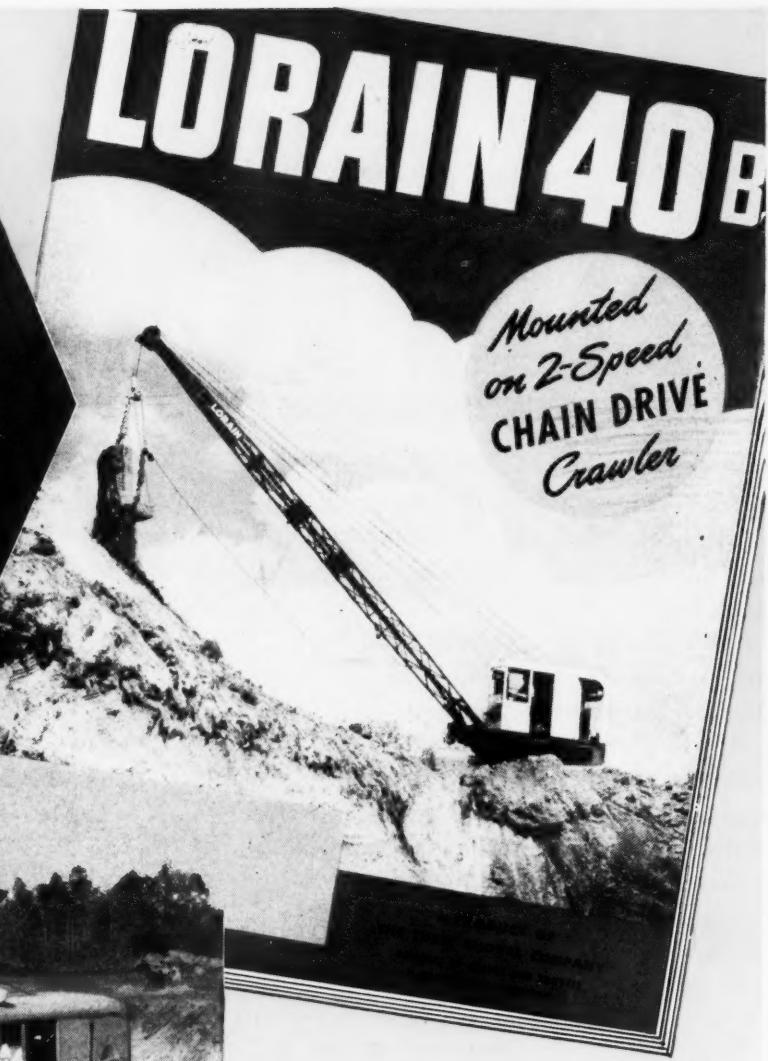
Good News

FOR

**SHOVEL, CLAMSHELL
CRANE, BACKDIGGER
and DRAGLINE USERS!**

LORAIN 40-B

Mounted
on 2-Speed
CHAIN DRIVE
Crawler



HERE—in the Lorain 40-B is a new, improved version of a machine that has already proved its profit-making ability on literally thousands of jobs. Replacing the $\frac{3}{4}$ -yard Lorain 40-A, the Lorain 40-B adds many features and advantages to a favorite, tested design.

There's a new, longer, heavier 2-speed chain drive crawler for better stability and extra maneuverability . . . extra soft ground flotation . . . balanced design turntable—and many other features

that mean extra working and earning capacity in your new Lorain 40-B.

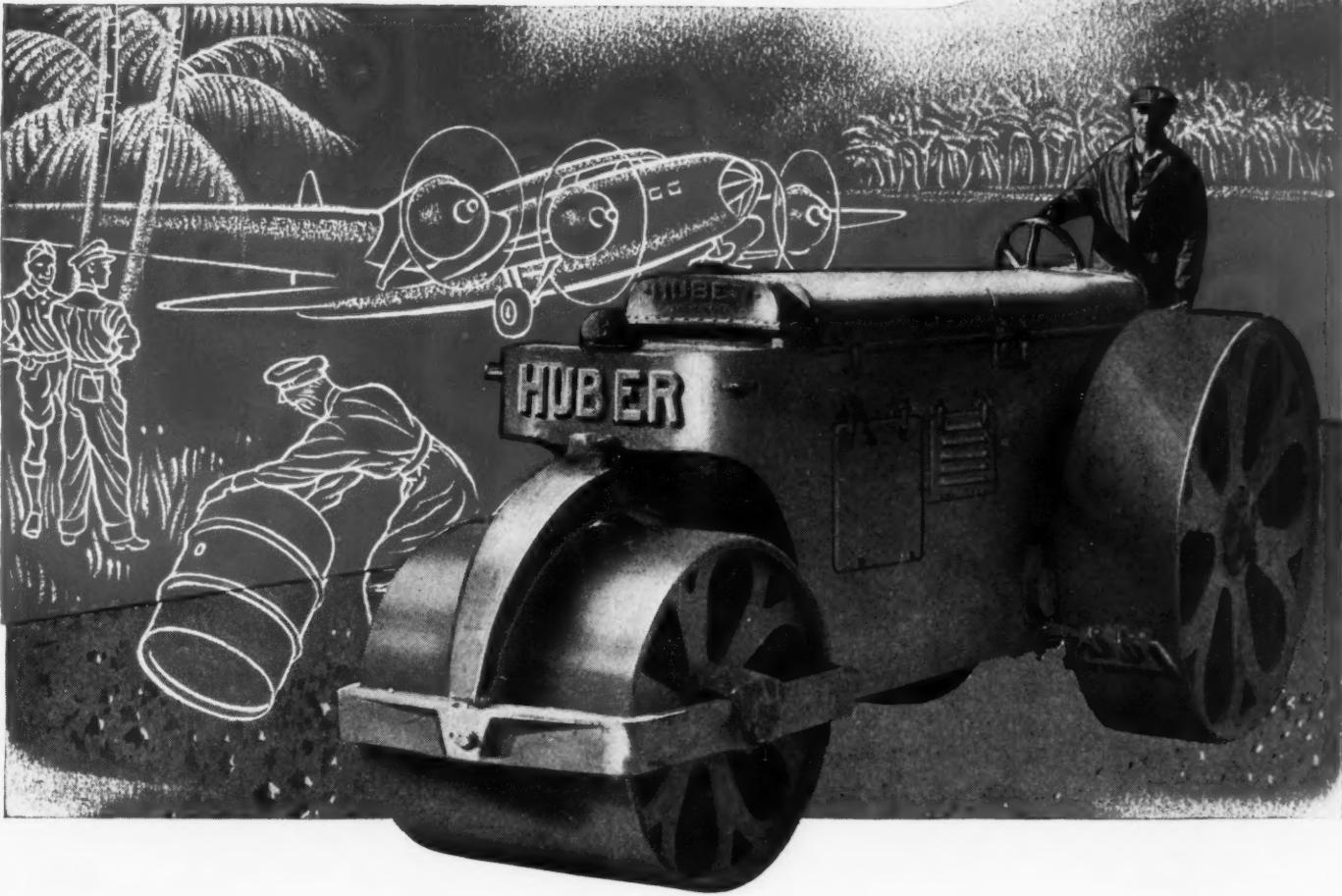
Send today for the Lorain 40-B catalog shown above. It gives you full details—in pictures, words, charts, and figures—on this improved Lorain. Whether you're interested in dragline, shovel, crane, clamshell or backdigger work you'll find good news and new profits in the Lorain 40-B! Write for your catalog now!

Reg. Trade Mark
thew. Lorain

CRANES • SHOVELS • DRAGLINES • MOTO-CRANES

THE
THEW SHOVEL CO.
LORAIN, OHIO

**R's for the runways that lead to the air,
H for the Hubers you'll always find there!**



Yes, sir, you'll find Huber Rollers busy all over the world on airstrip construction and maintenance . . . smoothing the take-offs and landings of our military aircraft . . . and bringing closer the day we can start delivering these new and improved Hubers to you.

THE **HUBER** MFG. COMPANY • MARION, OHIO, U. S. A.

HUBER ROLLERS

LAY-SET

TAKES THE

● Some machines are constructed with small-diameter sheaves and numerous reverse bends which are hard on wire rope. But that is exactly where Hazard **LAY-SET PREFORMED** shows up to its best advantage. Being preformed, **LAY-SET** resists twisting or squirming in sheave grooves. Being free of internal stresses, it can take the bends without undue fatigue. All around, Hazard **LAY-SET PREFORMED** is a safer, better wire rope. Specify it for your next line.

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SAN FRANCISCO

TACOMA

HAZARD WIRE ROPE DIVISION
AMERICAN CHAIN & CABLE
BRIDGEPORT

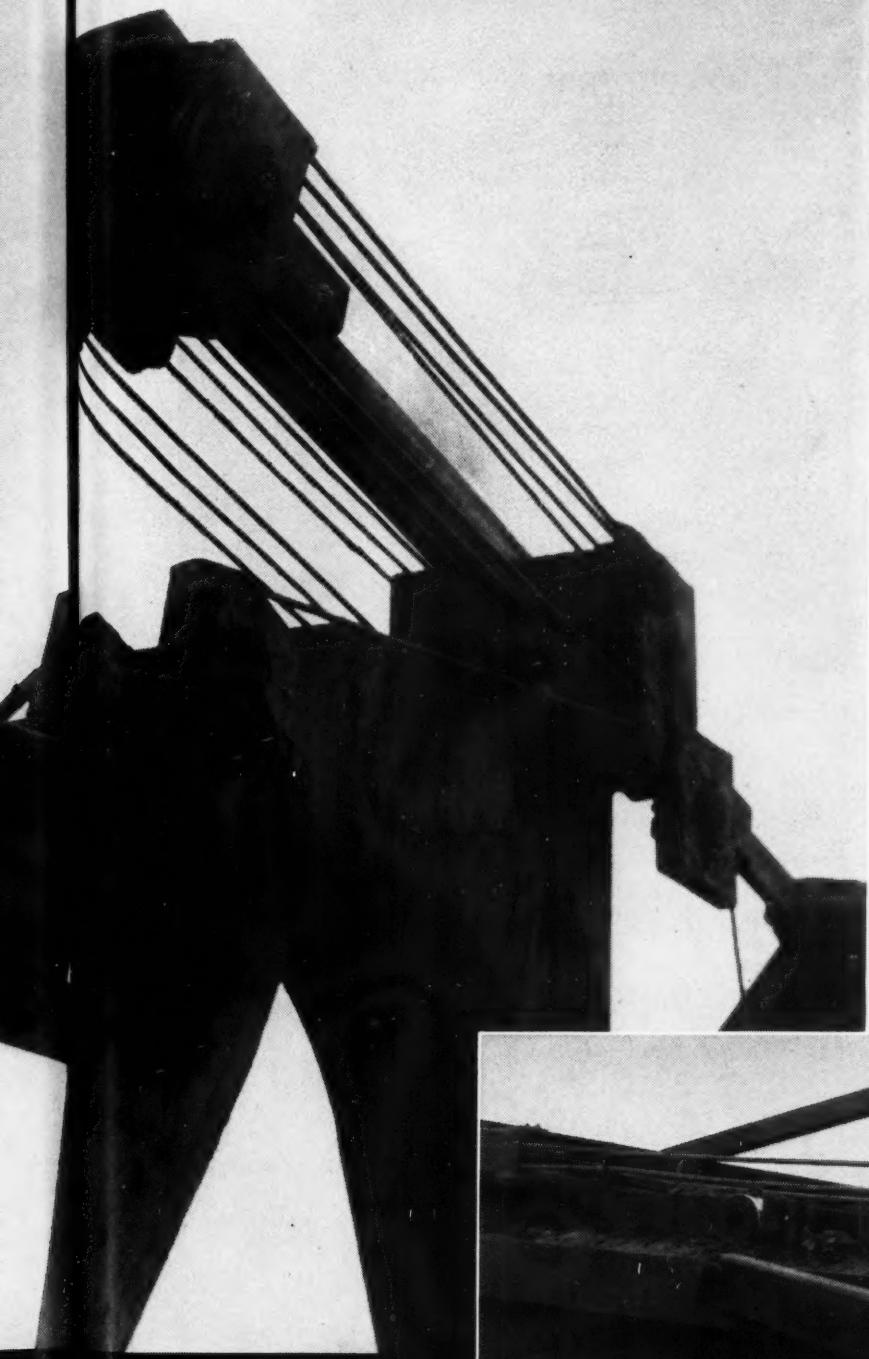


HAZARD

LAY-SET *Preformed* WIRE ROP

machines
small shea
capably
im

BENDS



OP machines are necessarily designed
small sheaves and reverse bends.
capably withstands the punishment
imposed by such conditions.

"WELCOME TO BURMA ... COURTESY OF THE HAIRY EARS"

"The Army Engineers are doing a big job in India. They are building a new route through Burma to replace the old road long since captured by the Japanese.

"Built as only American engineers and machines can do it, this new route crosses India's eastern border, crawls along her valleys and winds snake-like up the Himalaya slopes. It traverses malaria-infested valleys, then rises to 4,000-ft. elevations.

More Modern Methods than on Burma Road

"The new road is an example of American genius. The Army Engineers here put road building on a mass-production basis. When they sent a machine ahead to do one job they never let it come back over the same piece of road the second time.

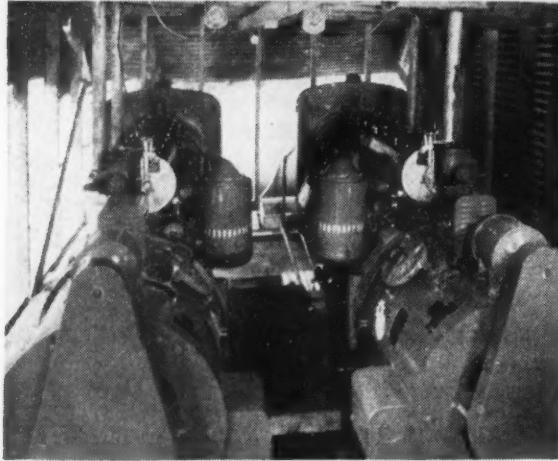
"The 'Hairy Ears' moved in through the tea fields into India's Assam Province. They set up their advance camps, unloaded machinery, worked seven days a week through incessant rain and temperatures that soared to 130°,—and gripped to the high heavens as good soldiers will. With grim humor one corporal named his bulldozer, with neat white letters, 'My Assam Dragon.'

"The supply of wire rope was most important, because cable-controlled machines were doing all the work. American-made preformed improved plow steel rope gave long-life through its ability to resist bending fatigue and drum crushing. These engineers found that pre-formed sometimes far outlasts non-preformed. Supplying it on the new Burma Road no doubt saved both time and valuable cargo space in the ships which had to transport it."





MORE Economy FOR BIG JOBS!



Two Model ME-650 MURPHY DIESEL "Package Type" Generating Sets, 106 KW each, equipped with synchronizing equipment supplying power for Contractors Service Corporation's quarry in Pennsylvania.

TWO HUSKY MURPHY DIESELS POWERED THIS BIG JOB

On this large quarry operation, just outside of Harrisburg, Pennsylvania, The Contractors Service Corporation used two Murphy Diesel Generating Sets as the power plant, with outstanding success. Standard Murphy Diesel units may be hooked up in any multiple to provide ample power for peak loads, and maximum economy for partial loads when the full combined engine power is not required. ★ Engineered for heavy-duty service, Murphy Diesels are living up to their reputation of more power, more profit for users. Rugged, compact, relatively light in weight, readily portable, simple and economical to operate and maintain, Murphy Diesels have won well deserved popularity throughout the construction industry where dependable power is a "must". WRITE FOR BULLETIN.

SELL WAR BONDS

More Power

MURPHY
DIESEL
Reg. U.S. Pat. Off.

More Profit

MURPHY DIESEL COMPANY
5339 West Burnham Street • Milwaukee 14, Wisconsin

Engines: FROM 90 to 215 HP
Generators: FROM 60 to 115 KW

"FIELD-PROVEN POWER"

104

MORE AIR FASTER!
WHEN YOU USE
SCHRAMM AIR COMPRESSORS

So you've another tough construction job that calls for an air compressor able to furnish a steady flow of air in great quantities?

This feature you specify—it's provided in all Schramm Air Compressors, portable and stationary. Note, for instance, in the illustrated action picture, how easily Schramm is doing the job—and furnishing all the air needed!

Schramm Compressors are lightweight—compact—sturdy units, able to stand rugged and constant use. If you are not already using a Schramm Compressor, it will pay you to write for details at once.

SCHRAMM INC. THE COMPRESSOR PEOPLE
WEST CHESTER PENNSYLVANIA



"Will Wellpoints Work On My Job?"



The Moretrench two-valve jetting tip prevents back-wash and waste of the jetting water through the screen.

**PROBABLY! WHY NOT
ASK MORETRENCH?**

IF THE BORING DATA INDICATE THAT THEY ARE NOT FEASIBLE OR ECONOMICAL, WE'LL BE THE FIRST ONES TO TELL YOU.

MORETRENCH SPECIALIZES IN DEWATERING THOSE DIFFICULT JOBS THAT SOME PEOPLE THINK "CAN'T BE WELL-POINTED".

THAT'S BECAUSE MORETRENCH WELLPOINTS ARE BUILT TO PRODUCE RESULTS IN ANY SOIL REQUIRING PREDRAINING.

SUPERIOR EQUIPMENT PLUS EXPERIENCED ENGINEERS AND DEMONSTRATORS CAN BE OF VALUABLE HELP ON YOUR WET WORK. PLAN TO USE THEM AT THE NEXT OPPORTUNITY.

FOR SPECIFIC ILLUSTRATIONS OF SUCCESSFUL WELLPOINT OPERATION IN DIFFICULT SOIL, SEND FOR OUR CATALOG. IT COVERS PRACTICALLY EVERY TYPE OF WET EXCAVATION, INCLUDING MUD.

We invite your inquiries on present or post-war projects.

MORETRENCH CORPORATION

90 WEST STREET, NEW YORK 6

321 EUTERPE ST.
NEW ORLEANS 13, LA.

ROCKAWAY, NEW JERSEY

3037 SO. CHRISTIANA AVE.
CHICAGO 23, ILL.

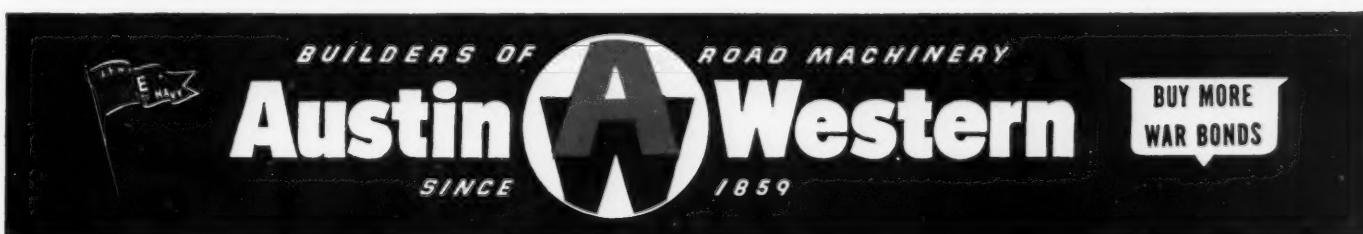


- Jobs must be waiting when the war is over... jobs for eight to ten million men in the armed services when they come home. An adequate highway program guarantees large-scale employment.

The highway profession faces the task of providing for a post-war program that will meet the nation's economic needs. The annual program must be in BILLIONS if it is to fulfill this purpose. Every Highway Department should have a program *complete with plans, specifications, and cost-estimates*.

Little plans will not get rid of worn-out, obsolete roads and streets, unsafe bridges, and traffic congestion. Little plans will not build express highways between cities, or arterial routes into and through cities. Little plans will not provide the sound program, based upon the nation's economic needs and actual highway needs, which will pay dividends far beyond the cost. Make no LITTLE plans!

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS





• Twenty-five leading equipment dealers in twenty-five principal cities throughout the United States are now authorized dealers for the Wood Roadmixer. More are being appointed. Prospective purchasers and present owners of Wood Roadmixers, wherever they may be, now have access to convenient, on-the-spot sales and service facilities.

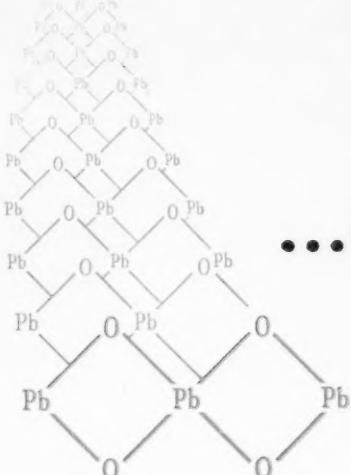
The names and addresses of these dealers are shown in this advertisement. See them or write them for descriptive literature and costs on the Wood Roadmixer—the pioneer and leading travel plant method of low cost, high quality pavement construction.

AUTHORIZED WOOD ROADMIXER DEALERS

ALBUQUERQUE, New Mexico Hardin & Coggins 1717 No. Second	MEMPHIS, Tennessee Tri-State Equipment Co. 124 East Calhoun Ave.
BALTIMORE, Maryland Alban Tractor Co., Inc. 721-727 E. 25th St.	MILWAUKEE, Wisconsin Hunter Tractor & Machinery Co. 327 South 16th St.
BILLINGS, Montana Industrial Equipment Co., 415 No. 27th St.	MINNEAPOLIS, Minnesota Rosholt Equipment Co. 3138 Snelling Ave.
CHEYENNE, Wyoming Wortham Machinery Co., 517 West 17th St.	NEW ORLEANS, Louisiana Woodward, Wight & Co., Ltd. 451 Howard Ave.
CINCINNATI, Ohio The Bode-Finn Co. 1654 Central Ave.	NEW YORK, New York H. O. Penn Machinery Co. 140th St. & East River
COLUMBIA, South Carolina Southern Equipment Sales Co., P. O. Box 1341	NORFOLK, Virginia Hampton Roads Tractor & Equip. Co. W. 39th St. & Killem Ave.
DES MOINES, Iowa Herman M. Brown Co. 1st & Sheridan Sts.	OKLAHOMA CITY, Oklahoma Herd Equipment Co. 922 N. W. 5th St.
DETROIT, Michigan W. E. Phillips Equipment Co. 7279 Artesian Ave.	OMAHA, Nebraska Fehrs Tractor & Equipment Co. 1809 Cuming St.
HYDE PARK, Massachusetts Parker-Danner Company 25 Factory St.	PHOENIX, Arizona State Tractor & Equipment Co. P. O. Box 3795
JACKSONVILLE, Florida Florida-Georgia Tractor Company P. O. Box 1649	RALEIGH, North Carolina North Carolina Equipment Co. 3101 Hillsboro St.
KANSAS CITY, Missouri The G. W. Van Keppel Co. 2440 Pennway	SALT LAKE CITY, Utah Arnold Machinery Co., Inc. 153 West 2nd South St.
LOS ANGELES, California Garlinghouse Bros. 2416 East 16th St.	SAN ANTONIO, Texas J. E. Ingram Equipment Co. 1146 West Laurel St.
	SAN FRANCISCO, California Coast Equipment Co. 948 Bryant St.



Uniformity of Chemical Composition



...another real reason why RED LEAD means Extra Protection against Rust

Red Lead's outstanding uniformity of performance results not only from its extreme purity but also from its precise chemical composition... lead orthoplumbate. This makes for predictable chemical behavior.

For many years Red Lead has been the standard among metal protective paints because of inherent fundamental properties of the pigment itself.

Among the most important of these is Red Lead's definite chemical composition and uniformity—as distinguished from pigments which have indefinite composition or vary from batch to batch, with resulting possibility of variation in performance.

One reason for this uniformity is that Red Lead is a simple chemical compound, being made from oxygen and high purity metallic lead. Consequently, Red Lead is an extremely pure compound. It contains no corrosion accelerating impurities such as water-soluble salts of chlorides or sulfates.

Uniform composition means dependable performance, day after day, job after job.

Furthermore, Red Lead has the property of counteracting acid conditions, recognized as accelerators of rust. In the presence of various acids, Red Lead forms

insoluble neutral lead salts at the approximate rate at which the acids are supplied. This is true whether the acids originate from acid forming environments, such as gas, smoke and moisture in the atmosphere, or from the decomposition of the vehicle. Thus, a rust inhibiting condition is maintained with a Red Lead paint.

Remember, too, that Red Lead is compatible with practically all vehicles commonly used in metal protective paints, including phenolic and alkyd resin types.

Specify RED LEAD for All Metal Protective Paints

The value of Red Lead as a rust preventive is most fully realized in a paint where it is the only pigment used. However, its rust-resistant properties are so pronounced that it also improves any multiple pigment paint. No matter what price you pay, you'll get a better paint for surface protection of metal, if it contains Red Lead.

Write for New Booklet

"*Red Lead in Corrosion Resistant Paints*" is an up-to-date, authoritative guide for those responsible for specifying and formulating paint for structural iron and steel. It describes in detail the scientific reasons why Red Lead gives superior protection. It also includes typical specification formulas. If you haven't received your copy, address nearest branch listed below.

* * *

The benefit of our extensive experience with metal protective paints for both underwater and atmospheric use is available through our technical staff.



NATIONAL LEAD COMPANY: New York 6, Buffalo 3, Chicago 80, Cincinnati 3, Cleveland 13, St. Louis 1, San Francisco 10, Boston 6 (National-Boston Lead Co.); Pittsburgh 30 (National Lead & Oil Co. of Penna.); Philadelphia 7 (John T. Lewis & Bros. Co.)

**DUTCH BOY
RED LEAD**

LIMA TYPE 1201 (3 and 3½ yd. CAPACITY) SETS THE TREND FOR GREATER OUTPUT



The smooth, effortless control of the LIMA Type 1201 is made possible through air-operated clutches. This all-important feature assures more economical operation and greater output thru less operator fatigue. A simplified clutch adjustment is necessary and when made, will retain the adjustment for several months. A LIMA Type 1201 with air-control means more productive time on the job.



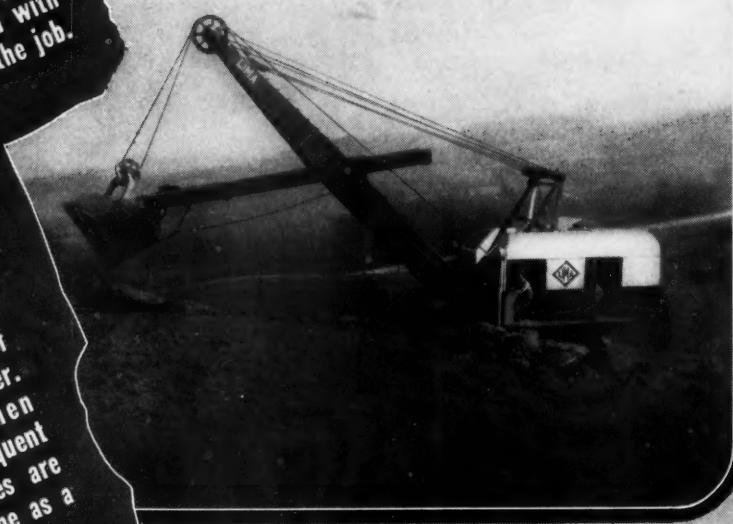
The LIMA Type 1201 can hoist, swing, travel or boom up or down at the same time. This advantage enables the user to do a wider variety of work without the loss of moves in close quarters or where frequent moves are necessary. Independent clutches are especially desirable when working machine as a crane.



The greatest destroyer of machinery is friction. This profit-taking hazard is overcome in the LIMA Type 1201 by the use of anti-friction bearings at every vital bearing point. LIMA does not stop at putting these wear resisting bearings in the clutches, drums, cone rollers and other points where friction is commonly found. It costs less in the long run to operate a LIMA.

Capacities

CRANES 13 TONS TO 100 TONS
SHOVELS $\frac{3}{4}$ YD. TO 5 YDS. DRAGLINES, VARIABLE



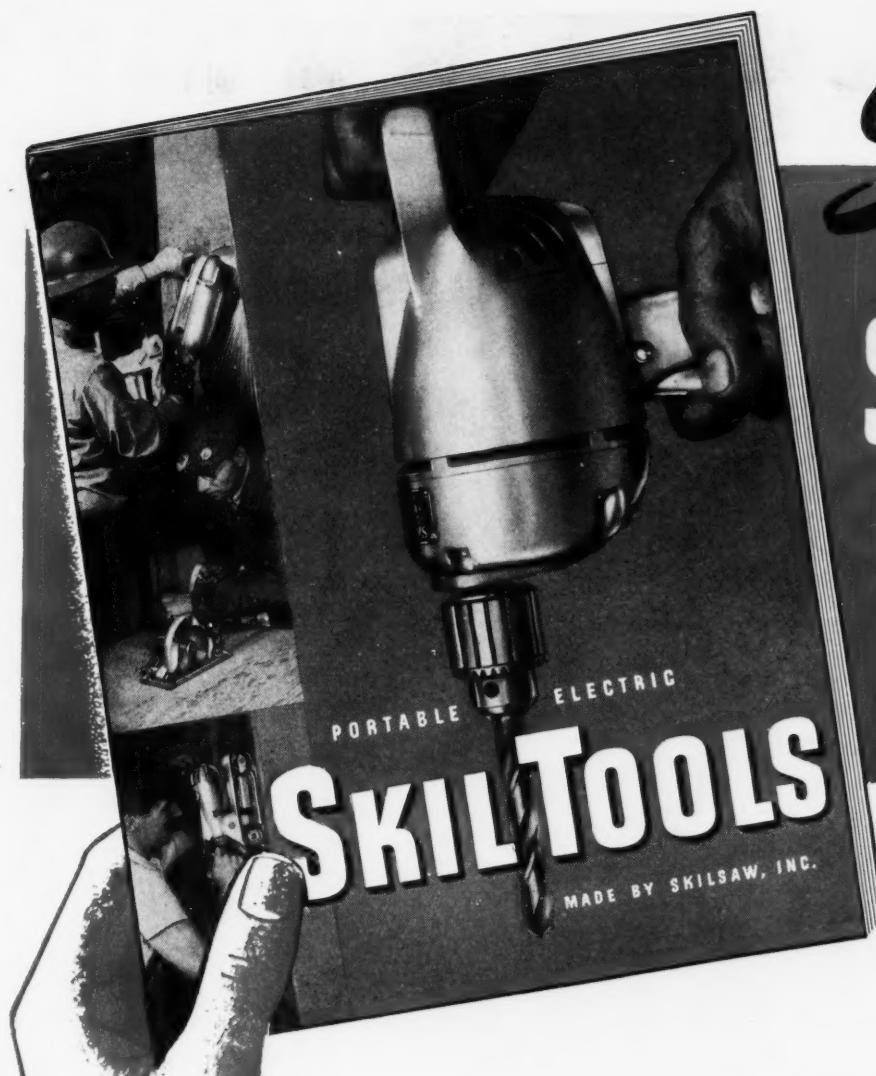
Regardless of how carefully a job is figured, how skillfully it is laid out, profitable results depend on the selection of the right type of equipment and its advantages to make big output possible. The LIMA Type 1201 shown in the illustration is a 3 or 3½ yard shovel (depending on length of boom and handle) or a 65 ton crane. It is in high favor with quarry operators, open-pit miners and contractors who demand top-notch performance from the equipment they buy. Look to LIMA for the shovel, crane or dragline of the right capacity for the job you are planning.

LIMA LOCOMOTIVE WORKS, INCORPORATED
Shovel and Crane Division

NEW YORK, N. Y. PHILADELPHIA, PA. NEWARK, N. J. MEMPHIS, TENN. ST. LOUIS, MO.
DALLAS, TEXAS PORTLAND, ORE. MINNEAPOLIS, MINN.
SAN FRANCISCO, CALIF. SEATTLE, WASH. LOS ANGELES, CALIF. SPOKANE, WASH.
MONTREAL, Quebec, Can. VANCOUVER, B. C.

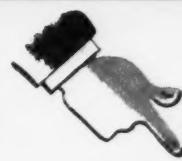
★ QUARRY WORK

*Cranes
Shovels
Draglines*



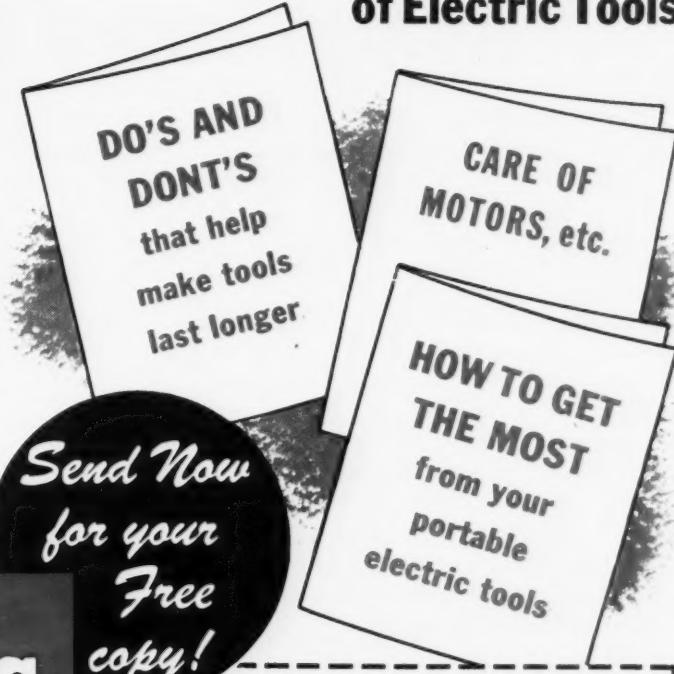
Send

FOR THIS NEW
**SKILTOOL
CATALOG**
just off the press!



**SPECIAL
SECTION**
on Care and Operation
of Electric Tools

Every owner, every operator of portable electric tools needs this manual to help make tools do their job better and last longer. The SKILTOOL Maintenance Manual in the SKILTOOL CATALOG is packed full of useful information on the care and economical use of *all* portable electric tools. Whether you use SKILTOOLS exclusively... or whether you also use other makes... you'll save money and delay the need for tool repair by reading and heeding the advice in the new SKILTOOL Maintenance Manual and Catalog. It's yours for the asking. Mail the coupon today!



PORTABLE ELECTRIC
SKILTOOLS
MADE BY SKILSAW, INC.

5033-43 Elston Ave., Chicago 30, Ill.
Factory Branches in All Principal Cities

SKILSAW, INC.

5033-43 Elston Avenue, Chicago 30, Illinois

Please send.....free copies of your new SKILTOOL Catalog with Special Tool Maintenance Section to:

Name.....

Address.....

City..... State.....



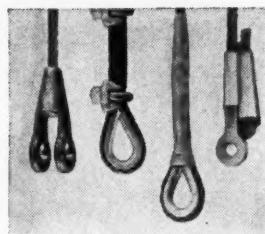
BEACH-HEAD BULL SESSION

"Tex" was formerly a driller in the oil fields; Oscar, a rigger in a logging camp; Joe, a dragline operator; and Bill, a shovel runner for a construction outfit. Now they, and thousands like them, are building bases 'round the world.

In a bull session they'll gripe about lots of things—but mention preformed wire rope and they change their tune. Back home, in scores of industries, they learned an affectionate respect for its dependability. And on foreign soil, with supplies hard to get and time at a premium, stout wire rope is doubly vital.

WISSCOLAY Preformed Wire Rope, manufactured by Wickwire Spencer, not only lasts longer, but it's easier to cut, splice and install—safer to handle. Using it saves money, man hours and critical material. Wisscolay Preformed, like regular Wickwire Rope, is made in all sizes and constructions.

If you have a wire rope question our wire rope engineers will be glad to be of service. Call or write our nearest branch office or Wickwire Spencer Steel Company, 500 Fifth Avenue, New York 18, New York.



WHICH ATTACHMENT IS BEST?

The proper types of attachments and applications are two of the many useful ideas you'll find in "Know Your Ropes." This 82-page book contains 78 "right and wrong" illustrations, 40 wire rope life savers, 20 diagrams, tables, graphs and charts. It can help make your present wire rope last longer.

SEND FOR YOUR
FREE COPY TODAY

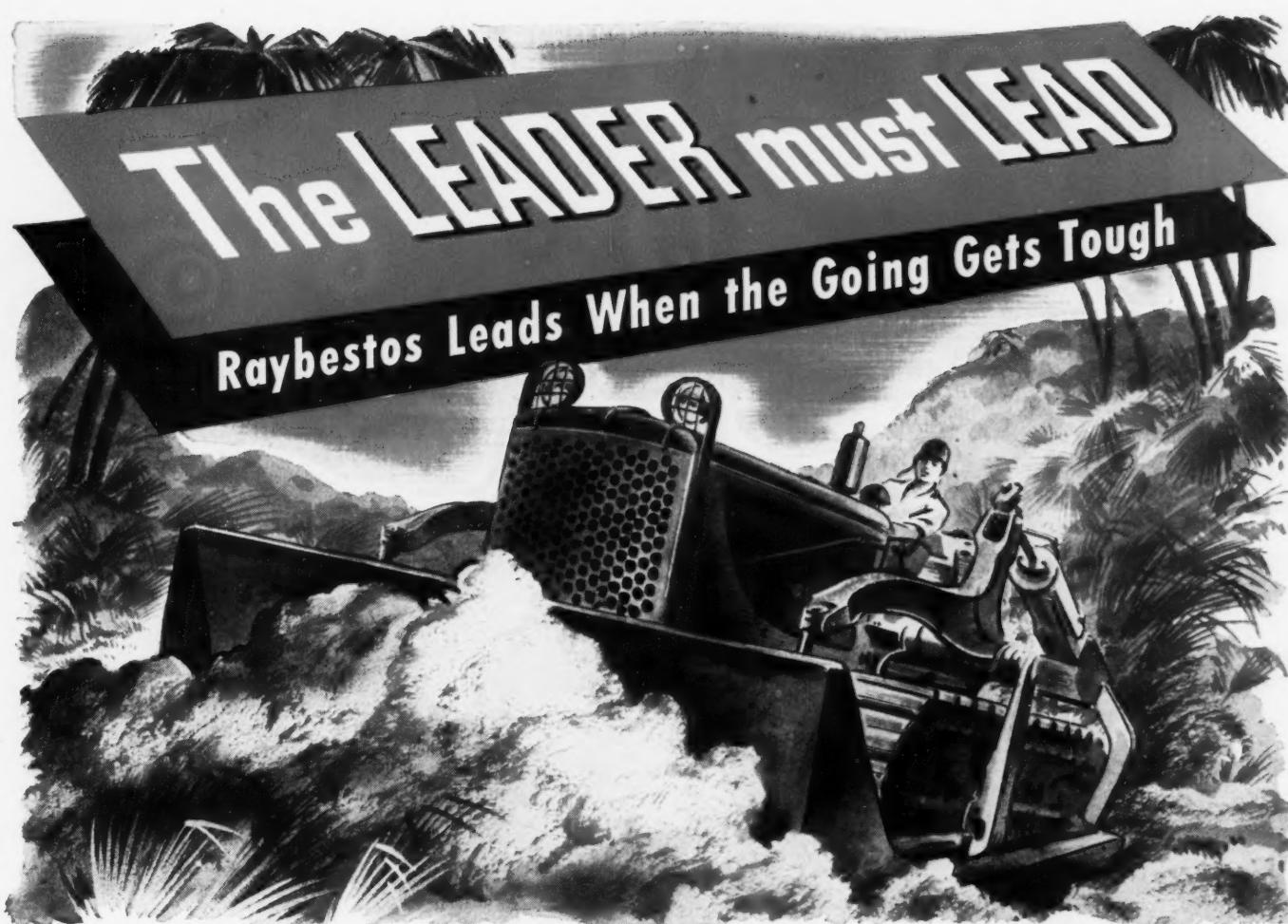
Send your wire rope questions to:

**WICKWIRE SPENCER
STEEL COMPANY**



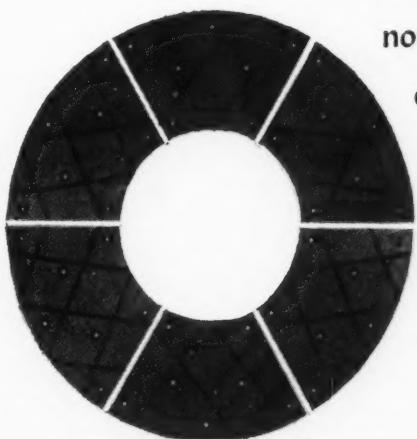
500 FIFTH AVENUE, NEW YORK 18, N.Y.

Abilene • Boston • Buffalo • Chattanooga • Chicago • Clinton (Mass.) • Detroit • Houston • Los Angeles • Philadelphia • San Francisco • Tulsa • Worcester



It stands to reason that Raybestos Friction Materials which control the 1000 h.p. of an army tractor operating on the world's toughest terrain, will control any industrial equipment ever built or ever likely to be built. ★ The same Raybestos engineering leadership, and even many of the same materials, that have successfully met war's "impossible" friction demands, go into the new and improved Raybestos Industrial Friction Materials now available for you. ★ The leader must lead. Raybestos experience gives you products that lead in performance and service.

THE RAYBESTOS DIVISION of Raybestos-Manhattan, Inc., BRIDGEPORT, CONN.



Ray-Met Master Clutch Facing for Tractors. A composition of asbestos and fine metallic powder.



BUY ANOTHER BOND

MANUFACTURING THE MOST COMPLETE LINE OF HIGHEST QUALITY METALLIC AND NON-METALLIC BRAKE LININGS AND CLUTCH FACINGS FOR EVERY TYPE OF EQUIPMENT, WAR AND CIVILIAN. ALSO FAN BELTS AND HOSE.



BEWARE!

DON'T LET RUST RUN WILD IN YOUR PLANT

IS SOME TERRIBLE PLAGUE, rust spreads its wings everywhere.

Annually this thieving demon costs American industry more than a billion dollars!

Until recently, rust has been accepted as a necessary evil in many operations.

Today, thanks to new developments, various types of rust-preventive coatings and lubricating oils are obtainable.

SHELL ENSIS RUST-PREVENTIVE COATINGS

As protection against rain and snow during outdoor storage, or high humidity conditions inside, Shell offers a complete line of Shell Ensis Rust Preventives. These oils, fluids, and compounds come in various grades, each designed to fit a specific condition. Protective coatings range from thin transparent coverings that need

not be removed, to coatings that resist extremes of weather over long periods.

SHELL TELLUS RUST-PREVENTIVE LUBRICATING OILS

Where moisture is a factor, Shell Tellus Oils are recommended for machine lubrication. These scientifically developed oils cannot remove rust once it has started. However, because of special, built-in, rust inhibitors, they afford protection against the formation of rust—this without loss of lubrication qualities.

Call in the Shell man. He is a trained man, competent to study your operation and advise you. Let him show you how to keep rust out of your plant. Write, wire or phone—
—Shell Oil Company Inc.,
50 West 50th Street, New York 20, N. Y., or 100 Bush Street, San Francisco 6, Calif.

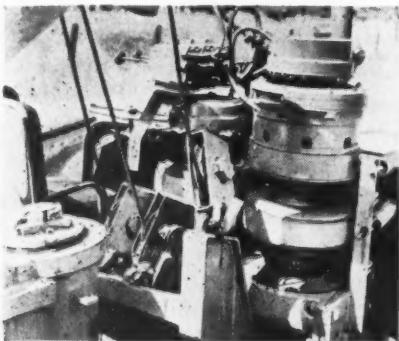


SELL LUBRICANTS FOR EVERY INDUSTRIAL USE



**Powerful Air-Operated
Cable Hoist**

Smooth operation at touch of a finger avoids "jerky" starts and stops. Takes up or releases to exact position desired. Saves cable wear and down time for repair.



• You never have to slacken speed with a Wooldridge Terra-Cobra while traveling, spreading or turning due to positive two-wheel hydraulic steering. Both wheels are controlled by a single steering bar. There are no steering clutches to fight nor individual brakes to grab—no danger of "jacknifing." The front drive wheels are under full traction and power at all times even on turns—and they maintain a fixed direction of travel over soft, rough, rocky or uneven ground. Rapid acceleration and surplus rim pull insures high average speeds and greater yardages at a lower cost. Get the full details on high speed earthmoving.

◀ WRITE TODAY FOR NEW TERRA-COBRA BULLETIN



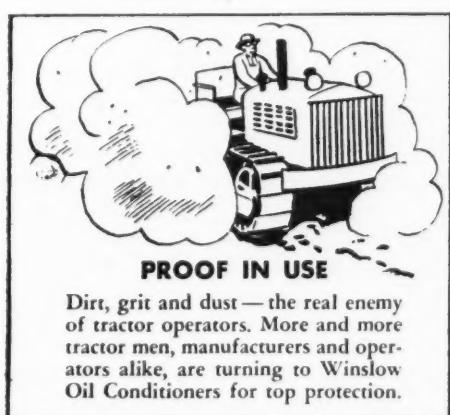
**WOOLDRIDGE MANUFACTURING CO.
SUNNYVALE, CALIFORNIA**





And when he gets them he'll reduce repairs, keep equipment in service longer, lengthen the period between overhauls and save money on lubricating oil too. That's why operators of heavy equipment are installing Winslow full-flow *in line* oil conditioners and Winslow Free-Flo Replacement Elements on the gasoline or Diesel engine they operate. ★ The numerous working parts and bearing surfaces in gas and Diesel

engines must have clean oil. That's a job for Winslow Filters! They remove grit, dirt, acid and moisture from the crank-case and assure plenty of clean lubrication for every working surface. Winslow Oil Conditioners also clean up a dirty engine, removing varnish and carbon and freeing rings and valve stems. Winslow Replacement Elements are available in more than 130 sizes for any standard make filter.



WINSLOW ENGINEERING COMPANY, OAKLAND 8, CALIFORNIA

WINSLOW

FUEL FILTERS • OIL CONDITIONERS • ELEMENTS



"THAT DRUM WEARS A SHOCKPROOF GIRDLE!"



"You can take it from me," said a well known contractor—"Rex has really got something in that shockproof girdle—the Chain Belt Drive that goes completely around the drum of a Rex Moto-Mixer."

Road shocks, strains of sudden stops and starts with a loaded drum are cushioned by the flexible Chain Belt Drive . . . are not passed on to transmission, power plant and other vital working parts. This feature also assures lower maintenance, fewer repairs and far longer truck life.

But the Chain Belt Drive isn't the only outstanding feature. For example, there's the new exclusive mixing action that enables Rex Moto-Mixers to mix low slump concrete . . . *fast!* The new easy-to-

replace mixing blades that are *bolted* to the drum. The patented method of water entry that introduces water behind the blades, right where the actual mixing action takes place. The special Rex water system that allows water to be drawn off in any desired quantity—on all sizes of mixers.

Rex Hi-Discharge Moto-Mixers have been consistently improved, but the basic design has remained unchanged because it was *right*—from the start!

For complete information about the Chain Belt Drive and other outstanding features, see your Rex distributor or send for your copy of Bulletin 405. Write Chain Belt Company, 1688 West Bruce Street, Milwaukee 4, Wisconsin.



CONSTRUCTION MACHINERY



PUMPS



PAVERS



PUMPCRETES

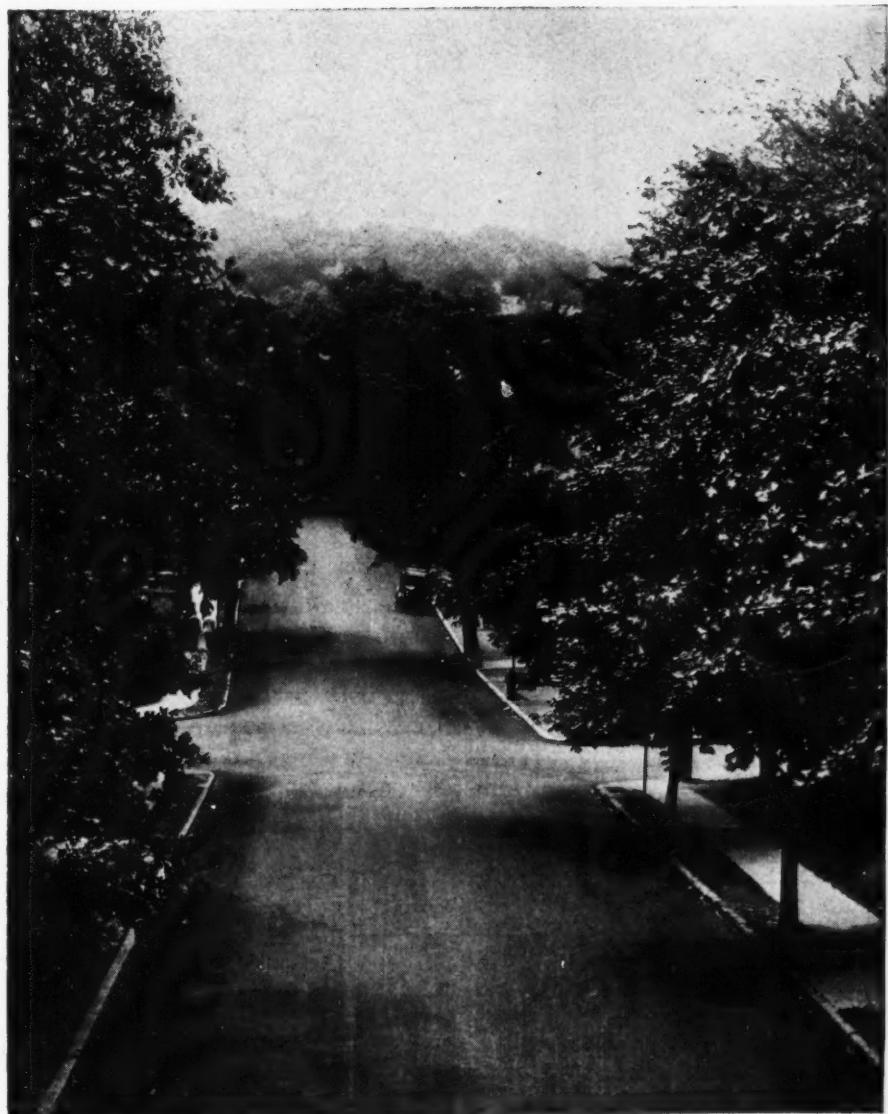


MOTO-MIXERS



MIXERS

The lasting smoothness you want from your pavement



Thanks to modern, highly perfected machine methods of laying Texaco Asphalt pavements, the road builder and motorist are assured of a higher standard of smoothness than ever before, without sacrifice of skid-resistance.

Pavements which hold their original smoothness through years of hard service have important advantages both for those who build them and those who use them. The fact that a smooth pavement is subjected to less traffic impact than an uneven one results in a lower maintenance cost. From a motorist's standpoint, the pavement which successfully maintains its smoothness gives him lasting driving comfort with a minimum of wear and tear on his car.

Principally because of their resilient, joint-free qualities, Texaco Asphalt pavements have been demonstrating an exceptional ability to preserve their original smoothness for the past 40 years. Today, thousands of square yards of 25 to 30 year old Texaco-paved streets and roads still possess an easy-riding quality, superior to that of many a pavement not half as old.

Texaco Engineers, who are specialists in Asphalt paving and maintenance, are at your service. Consult one of them about your street, highway or airport problem.



THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd St., New York City 17

Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 2 Philadelphia 2 Richmond 19



TEXACO ASPHALT



MACWHYTE G-15 CATALOG

"Quick, easy handling . . . smooth, uniform spooling . . . long, economical service — those are some of the *plus* benefits I get from Macwhyte PREformed," says the typical wire rope user.

Why Macwhyte PREformed is preferred

All wires and strands in a Macwhyte PREformed rope are formed into a spiral, so that they lie naturally in place. Because it is free from internal stress, a Macwhyte PREformed rope has great fatigue resistance. Internal friction caused by wires and strands moving against each other is sharply reduced, resulting in a minimum of internal wear.

In Macwhyte PREformed, every strand in the rope is under uniform tension. There is no "early" wearing out of some strands while others "loaf." The perfect balance of strands makes Macwhyte PREformed exceptionally kink resistant.

Other User Benefits

Macwhyte PREformed on your equipment means fewer shut-downs, less trouble. It is safer to use because it can be cut without seizing—broken strands won't wicker. The extreme flexibility of Macwhyte PREformed makes it hug the drum, reduces wear both on the wires and in the groove of the sheave. Because of its long life, Macwhyte PREformed gives lowest possible cost per load carried.



All this, and Macwhyte Internal Lubrication, too!

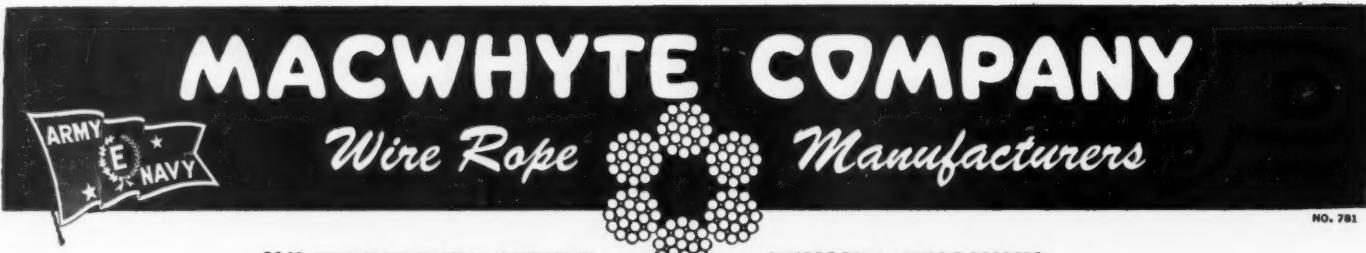
Every wire in every strand of Macwhyte PREformed rope is coated

with Macwhyte internal lubricant to protect against moisture, rust and ordinary acids. Heavy and tenacious, it clings to the wires unaffected by temperature changes.

The demands of our armed services are so great now, there may be times when we cannot give you our usual prompt service and delivery. The situation changes from day to day, so please keep trying. We'll serve you if we possibly can.



The correct rope for your equipment



Mill Depots: New York • Pittsburgh • Chicago • Fort Worth • Portland • Seattle • San Francisco. Distributors throughout the U.S.A.

MACWHYTE PREformed and MONARCH WHYTE STRAND Wire Rope MACWHYTE Braided Wire Rope Slings
Internally Lubricated Wire Rope MACWHYTE Special Traction Elevator Rope MACWHYTE Aircraft Cables and Tie-Rods
MACWHYTE Stainless Steel Wire Rope MACWHYTE Monel Metal Wire Rope

KOEHRING 205

NEW HALF-YARD CLAMSHELL CRANE

Get ready now for cost-cutting post-war crane operations with the new Koehring 205. Independent travel, swing, hoist and boom action, a feature reserved for big machines until now...PLUS fast line speeds...PLUS smooth-acting large diameter clutches and brakes. Capacity approximately 7 tons. Rud-O-Matic tagline. Standard machine has 30 ft. boom, 16 in. shoes.

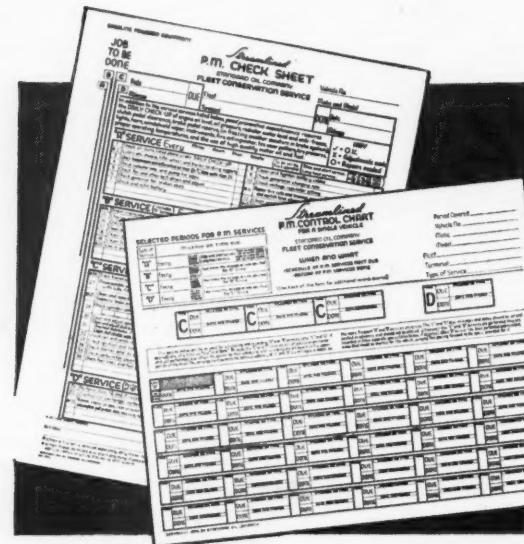
KOEHRING COMPANY
Milwaukee 10, Wisconsin

Orders Accepted NOW
for Post-War Delivery . . .

HEAVY-DUTY CONSTRUCTION EQUIPMENT

A new streamlined P. M. plan that will work with today's equipment and manpower shortages

1. **Eliminates many forms** usually required for record keeping.
2. **Fits any type of fleet**—bus, passenger car, or truck—in delivery or over-the-road operation—including trailer units.
3. **Takes less time** of skilled mechanics—only 20% of the P. M. work requiring a skilled mechanic.
4. **Provides a flexible mileage** or time interval for scheduling maintenance work to suit your individual operation.



One form — a P. M. Check Sheet — for maintenance men to use and a Control Chart for each truck are all that is needed with Streamlined P. M.

- **WITH** little new equipment in sight and the continued manpower shortage, the need for a sound preventive maintenance plan grows daily.

The first objective was to eliminate complicated forms when the Standard Oil Streamlined P. M. Plan was developed. In addition, the Plan was designed to fit any type of fleet operation.

Streamlined P. M. has been tested in a number of fleets, including one of the largest delivery and cross-country operations in the Middle West—our own fleet of passenger cars, delivery, and transport trucks. It has been proved conclusively that the Plan works if it is conscientiously followed. It shortens the time trucks are in the shop. It reduces road failures and cuts maintenance time and costs.

Ask the Standard Oil Representative who calls on you to explain this simplified P. M. Plan. He has a slide film that shows how P. M. works to your advantage. Call the local Standard Oil Company (Indiana) office, or write 910 South Michigan Avenue, Chicago 80, Illinois, for the Representative nearest you.

Buy more War Bonds

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**STANDARD
SERVICE**

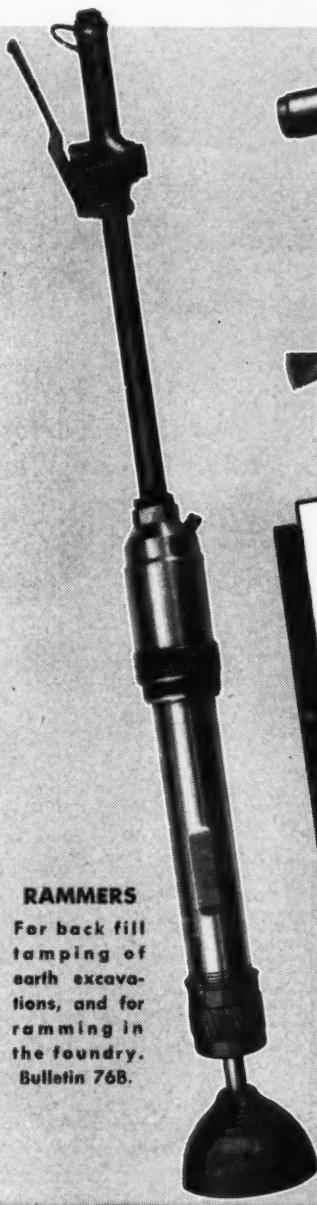
CLECO TOOLS

for
TODAY'S JOB
 and
TOMORROW'S



ROTARY GRINDERS

Ruggedly built, extra powerful. Many sizes, with straight or spade handles. Bulletin 80.



RAMMERS

For back fill tamping of earth excavations, and for ramming in the foundry. Bulletin 76B.



RIVETING HAMMERS

For heavy duty work with hot rivets. Three styles of handles. Bulletin 82.



RIVET BUSTER

To cut off rivet heads, break down walls, drive spikes and small drift bolts. Bulletin 82.



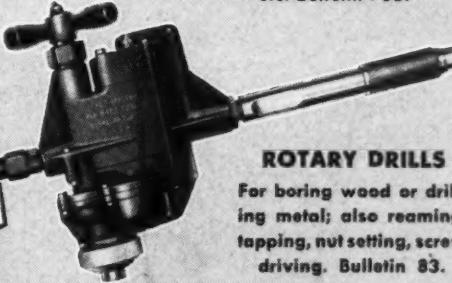
WIRE BRUSHING TOOLS

Husky rotary machines, used with radial wire brushes or cup wire brushes. Bulletin 80.



SCALING TOOLS

Handy hammers for cleaning paint, weld splash, scale from metal surfaces, etc. Bulletin 75B.



ROTARY DRILLS

For boring wood or drilling metal; also reaming, tapping, nut setting, screw driving. Bulletin 83.

THE CLEVELAND PNEUMATIC TOOL CO.

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Branch Offices in All Principal Cities

They Still Need Plenty of

THESE

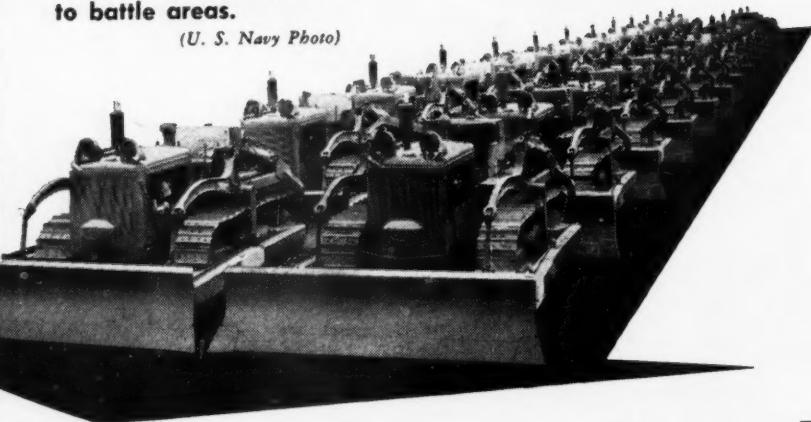


FRANCE — Bullgraders and Bulldozers help clear many rubble-strewn streets like this to permit our forces to roll forward.

(Signal Corps Photo)

This line-up of Bullgraders was massed on a dock for loading to a liberty ship and shipment to battle areas.

(U. S. Navy Photo)



... to Speed the Biggest Job of All!

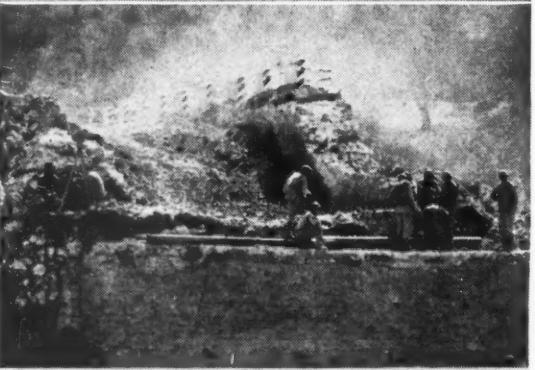
With every Allied advance, an already huge earth-moving task becomes enormous . . . and the need for Bullgraders and Bulldozers in wholesale lots continues to be acute. Bucyrus-Erie *en masse*, like the array above, are still streaming to the fronts . . . where they're needed most!

NBS



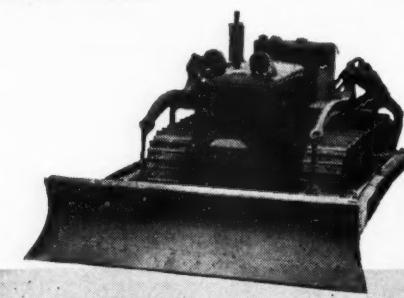
SOUTH PACIFIC — It takes batteries of Bullgraders to convert an island into an airstrip. Almost all of this island was cleared for taxiways and revetments.

(U. S. Army Air Forces Photo)



SICILY — Reconstructing a blasted bridge. In Sicily and more recently in Italy, scenes like this mean more and more work for blade equipment.

(Signal Corps Photo)



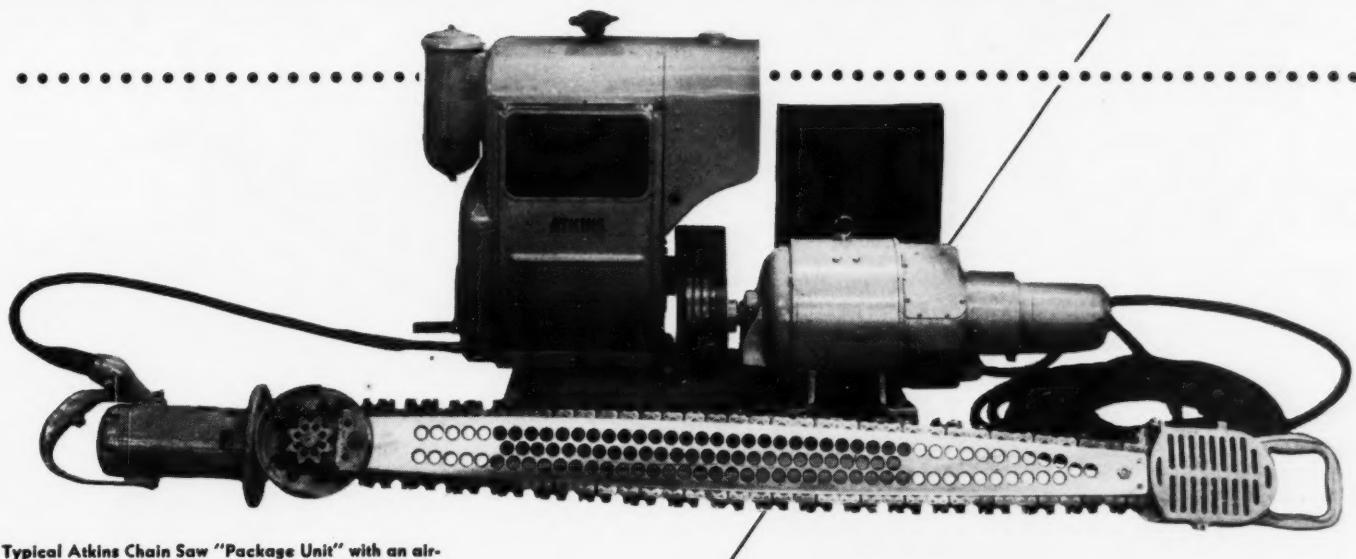
Because the armed forces are claiming almost all of our current production, only a very limited number of machines is available for high priority civilian operations. See your International TracTractor Distributor for information on new machines, rentals, or service; let him help you with your plans for modernizing your equipment at Victory.

BUCYRUS-ERIE CO., SO. MILWAUKEE, WIS.

**BUCYRUS
ERIE**
TRACTOR EQUIPMENT

SEE YOUR
INTERNATIONAL TRACTRACTOR
DISTRIBUTOR

ATKINS Chain Saw



Typical Atkins Chain Saw "Package Unit" with an air-cooled gas engine and generator mounted for use on trailer, truck or tractor. The saw can be operated up to 1000 feet from the generator unit by means of cable.

To Speed Up Your
HEAVY-DUTY SAWING

The Quick, Efficient Way of Sawing Heavy Timbers, Planking, Etc.

Atkins Chain Saw can help you streamline another phase of your operations. This is your heavy-duty sawing — big timbers, heavy planking, piling, logs, etc.

Because Atkins Chain Saw does such sawing mechanically, your men can handle these tough jobs in a fraction of the time and without the back-aches and hard labor needed for manual sawing. The result: lower costs on sawing jobs and a real "break" for workers.

Atkins Chain Saw is light in weight and easy to handle. And because it's electrically powered, it operates dependably under virtually all climatic conditions.

Yes, put Atkins Chain Saw down as another important Atkins contribution in the field of saws and cutting tools. Write for Atkins Chain Saw Bulletin today.



Atkins Has the
RIGHT SAW
for Every Job

No matter what the job, Atkins has the specific type of saw to help you do it faster. The Atkins line includes Docking Saws, Hand Saws, One-Man and Two-Man Crosscut Saws, Circular Saws for portable power saws, Hack Saw Blades, etc.

E. C. ATKINS AND COMPANY • 485 South Illinois Street, Indianapolis 9, Indiana
Agents or Dealers in All Principal Cities the World Over

Bucyrus-Erie Co. Makes Biggest Dragline Excavator

46 RAILWAY CARS TRANSPORT DEVICE HAS WALKING EQUIPMENT

The 1150-B excavator can dig 140 feet deep and can dump about 360 feet from where it digs. It has a 25-yd. drag bucket on a 180-foot boom. The combined weight of the bucket and full load is 130,000 pounds.

Aside from its size the phenomenal thing about a machine weighing 2,410,000 pounds is—it walks.

The walking equipment is composed of three major operating parts on each side of the revolving frame

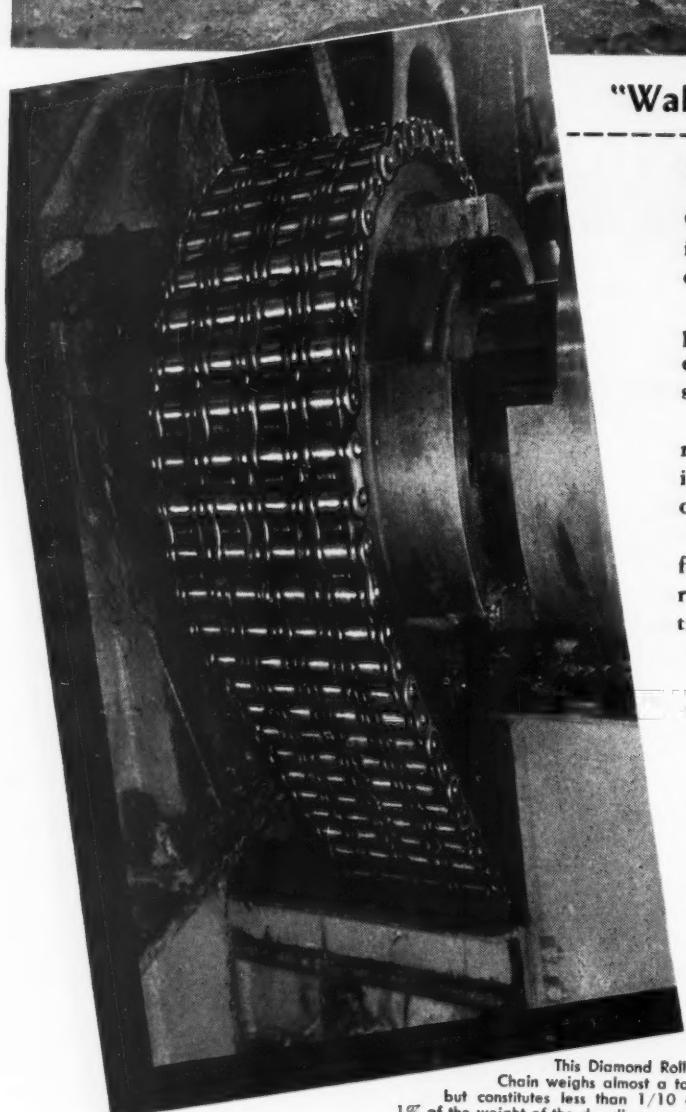
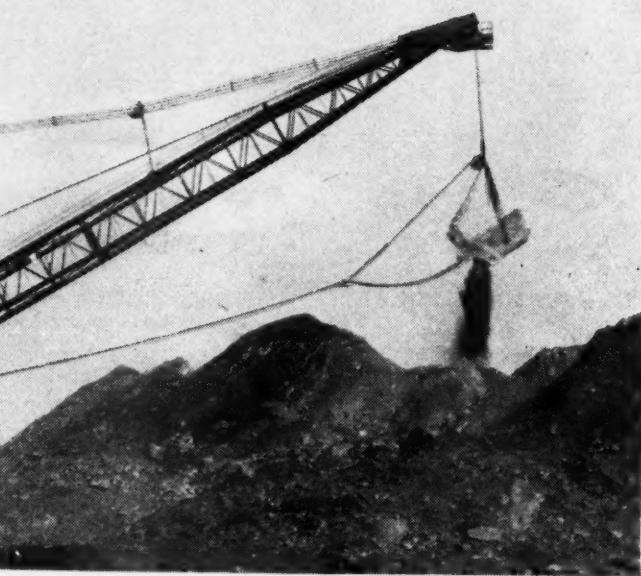
—cam, cam track, and shoe—and like a huge giant the machine steps off 7½ feet at one time. Needing no steering mechanism, the 1150-B moves in whatever direction the walking shoes point. It can sidestep at any angle, zigzag between work locations, travel over soft and irregular ground, and can detour around obstructions. Direction is changed simply by swinging the revolving frame.

While digging, the walking shoes are carried high on the frame. To walk, both shoes are lowered simultaneously, part of the weight is transferred from the mast to the shoes; the base tilts lifting the forward part free of the earth; and the whole machine skids forward and then settles down without a jerk or shock.

On the Revolving Frame

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"Walking" Mechanism of This Giant Dragline

Employs Massive Roller Chain Drive

One of the most massive multiple-strand roller chain drives ever installed in this country is employed in the power train to the cams of the walking mechanism.

This Diamond Roller Chain drive consists of 4-strand 2½-inch pitch chain meshing with sprockets of 3 foot and 7 foot diameters. It will easily handle peaks of 2000 horsepower. The ultimate strength of the chain is 200 tons.

The durability is such that no provision for chain take-up is required. The center distance of the sprockets is fixed—no idler is needed. This conforms to customary practice in the installation of heavy duty drives as used, for example, in the oil industry.

On leading makes of drilling rigs, for wells of 5000 to 15000 foot depth, and deeper, including those with engines of total rating in excess of 1000 HP, the drives in the 3- and 4-speed transmissions are equipped with parallel Diamond Roller Chains,

the two sprockets for each of the various ratios being installed on a common, fixed center distance.

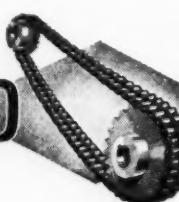
Plan Now for Machinery Improvements

Diamond Roller Chains are available for transferring power at very low speeds or at speeds as high as 8000 r.p.m., and in capacities from a fraction of a horsepower up to several thousand. DIAMOND CHAIN & MFG. CO., 418 Kentucky Ave., Indianapolis 7, Ind. Offices in All Principal Cities.



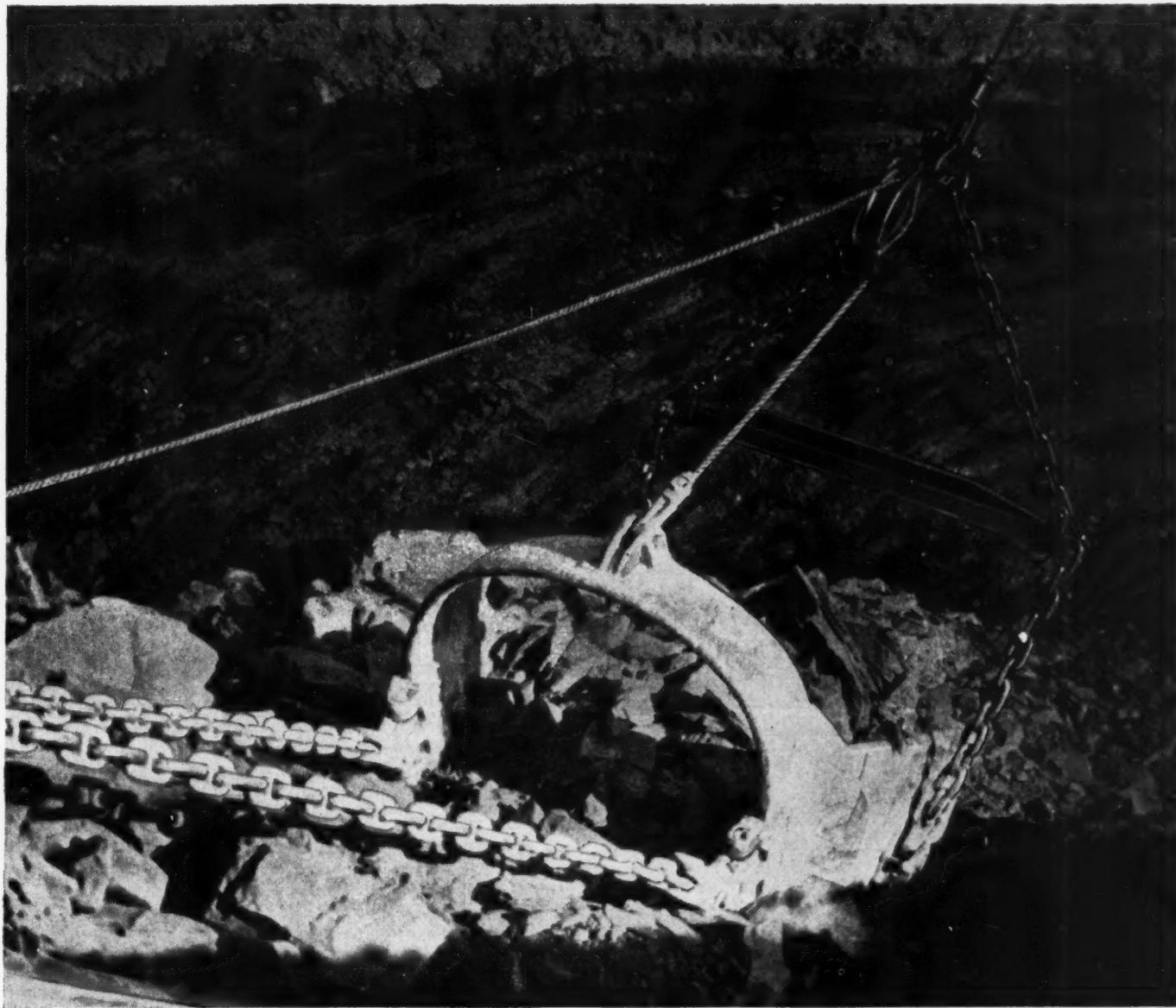
Catalog 617 contains 96 pages of roller chain data. Let us mail you a copy.

DIAMOND



ROLLER CHAINS

This Diamond Roller Chain weighs almost a ton, but constitutes less than 1/10 of 1% of the weight of the dragline.



**Coal Strippers Know...You've Got to
*TAKE IT OFF!***

**Results Show Page *Automatics*
Are Tops for Uncovering Coal...**

Used in more than 90% of the nation's coal stripping operations, Page AUTOMAT'C dragline buckets dig through soapstone, shale and blasted rock in record time . . . and yet clean off the coal without tearing it up. Everywhere, it's Page AUTOMATIC-DIGGING-ACTION for increased yardage and reduced maintenance costs!

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Automatic
DRAGLINE BUCKETS

PAGE ENGINEERING COMPANY, CHICAGO 38, ILLINOIS



NO-DRAG HAULS with this sure-roll tread

Goodyear All-Weather Earth-Movers on Bucyrus-Erie Scraper powered by International Diesel Tractor.

THEY'RE sure-footed. They're rugged. And these Goodyear All-Weather Earth-Mover tires really roll under full load — roll without time-wasting drag.

That's because their wide, rounded contours — which permit low inflation — provide the flotation needed for easier hauling. And the wider tread channels and sturdy diamonds of that famous All-Weather tread make for freer rolling and protection against snagging.

Fortified with a rugged bead construction which provides security against rocking, chafing and rim cutting, these tough giants are now further armored with Goodyear's patented Rayotwist cord — the strongest body we've ever used in a work tire.

That's why we score them as the

best work tires built from today's synthetic and permissible natural rubber — best for longest life and maximum efficiency.

More contractors than ever before

now buy these All-Weather Earth-Movers for their drawn units. And with Goodyears on your units you will soon know why "more tons are hauled on Goodyear truck tires than on any other kind."

THE RIGHT TIRE FOR EVERY JOB

Rayotwist-armored for extra strength



ALL-WEATHER
EARTH-MOVER
for drawn vehicles

HARD ROCK
LUG
for all rock work

SURE-GRIP
for drive
wheels

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All-Weather, Rayotwist, Sure-Grip—T.M.'s The Goodyear Tire & Rubber Company

GOOD YEAR

THE GREATEST NAME IN RUBBER

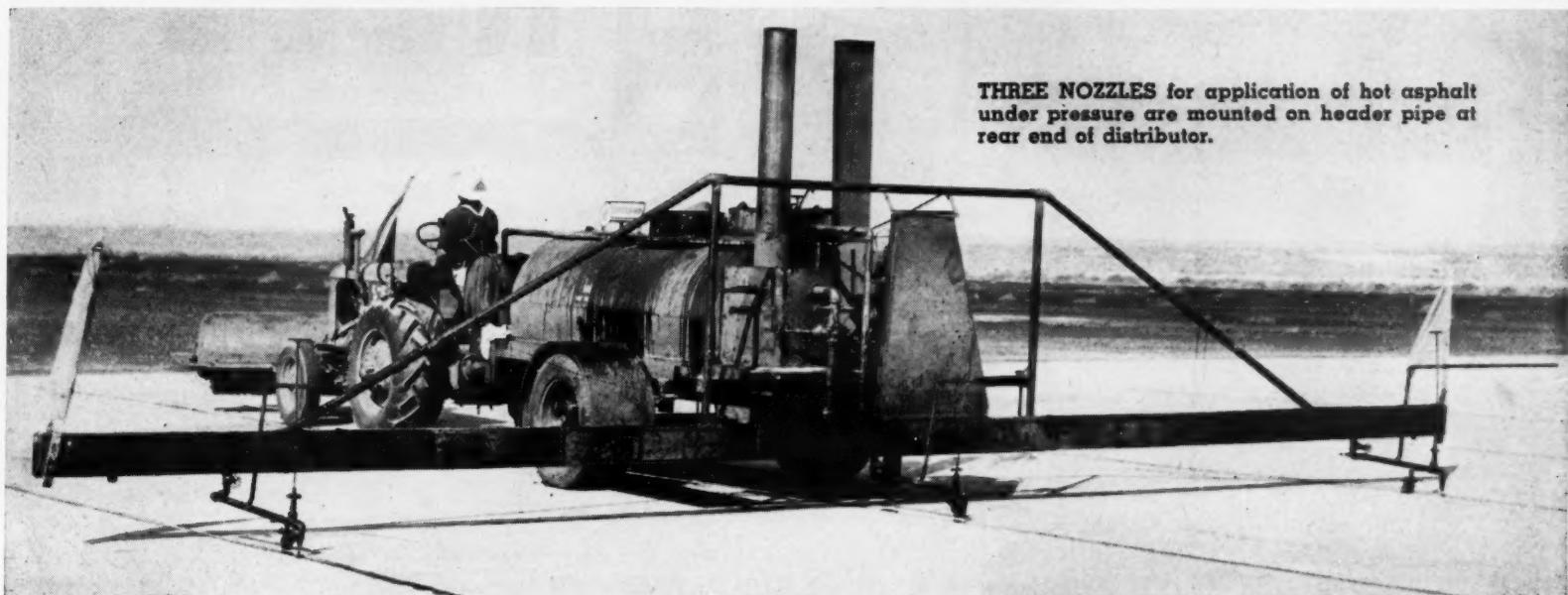
Construction Methods

ROBERT K. TOMLIN, Editor

Volume 27

MARCH, 1945

Number 3



THREE NOZZLES for application of hot asphalt under pressure are mounted on header pipe at rear end of distributor.

Three-Nozzle Filler

SPEEDS SEALING OF PAVING JOINTS WITH HOT ASPHALT

ASPHALT JOINT FILLER is being applied to concrete paving at fourteen times the rate in miles per man-hour attainable with small pots and hand methods by a job-made, three-nozzle, mechanical spreader developed at the Moses Lake Army Airfield in the state of Washington. The new device, it is claimed, makes possible a 50-percent saving in the amount of filler compound used and, by applying the asphalt under pressure, does a better job of joint filling.

As illustrated in the accompanying photographs, a special multiple-nozzle

rear end has been applied to a standard Littleford bituminous pressure distributor. Heated asphalt is kept in circulation through a 1½-in.-dia. header pipe to which nozzles may be connected at a number of points to take care of various joint spacings. The header is supported by a pipe bracket frame. At the end of each day's run diesel oil is pumped through the distribution system of pipe to flush it out and prevent clogging by asphalt cooling and hardening within the lines. In the suction line to the pump is an
(Continued on page 152)



WHEEL-TYPE TRACTOR hauls asphalt distributor which circulates hot asphalt through header bar at rear. Drum behind operator contains diesel oil for flushing piping system at end of day's work.

HOT ASPHALT IS APPLIED to joints by three nozzles fed by header through which material makes continuous circuit from heating tank and return. Sheet metal inclosure of header pipe reduces loss of heat.



WRECKED TRUCKS are lodged in stream to form foundation for log bridge constructed by U. S. Army infantry unit on Luzon in the Philippines.
Acme Photo

THIS MONTH'S NEWS REEL



PRELIMINARY STUDIES for construction to develop Missouri River Basin resources are planned at meeting of engineers, economists, and accountants of U. S. Bureau of Reclamation in Washington, D. C., Jan. 3-13. Congress-approved work program will cost more than \$400,000,000. Pictured (left to right, front row): E. B. DEBLER, regional di-

rector, Denver; WILLIAM E. WARNE, assistant commissioner; HARRY W. BASHORE, commissioner; JOHN C. PAGE, consulting engineer, Denver; H. D. COMSTOCK, regional director, Billings, Mont.; W. G. SLOAN, assistant regional director, Billings; A. A. BATSON, assistant regional director, Denver; (standing): WENDELL BRAMWELL, liaison officer.

Division of Finance: JOHN G. WILL, counsel; WILLIAM F. KUBACH, director of finance; CLARENCE EYNON, counsel, Denver; W. L. NEWMAYER, electrical engineer, Denver; J. R. RITER, director of project planning, Denver; WALKER R. YOUNG, chief engineer, Denver; G. W. LINEWEAVER, assistant to the commissioner; KENNETH F. VERNON, acting engineering assistant to the commissioner; J. A. KEIMIG, liaison officer, project planning; HAROLD E. ALDRICH (front), engineer, liaison branch design and construction; C. R. BEITMAN (rear), electrical engineer, Denver; FRED E. WILHELM, liaison officer, design and construction; BARROW LYONS, chief information officer.



HOLES FOR BLASTING CORAL (left) are drilled by U. S. Navy Seabees using Thor rock drills on Green Island in South Pacific. Area is being cleared for road from beach to interior of island.
Official Marine Photo

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AMERICAN SOLDIERS help demolish bombed building in London area. Three thousand men with varying building experience have been made available to British by General Eisenhower to help in London's reconstruction work.

Press Association Photo



FIRST CHINA-BOUND CONVOY rolls over Burma-Ledo roadway since Jap invasion of Burma in 1942. Chinese soldiers who fought to open 620-mi. highway, now named for General Stilwell, stand at sidelines and wave to passing trucks.



OUTSTANDING CONTRIBUTIONS TO CONSTRUCTION PROGRESS are recognized by Achievement Awards by The Moles, New York organization of tunnel and heavy construction men, to WILLIAM V. McMENIMEN (left), vice-president and general manager, Raymond Concrete Pile Co., New

York, builder of Pacific naval bases, and FRANCIS T. CROWE (right), who directed construction of many great dams, including Boulder and Shasta. With Award winners, pictured at dinner in their honor Feb. 7, is ARTHUR A. JOHNSON, Moles' president. Below are CARL L. SWENSON, vice-president, Foley Bros., Inc., and VICE ADMIRAL BEN MOREELL, chief, Navy Department Bureau of Yards and Docks, who made presentation speeches.

THIS EXHIBIT WAS PREPARED IN COOPERATION WITH THE CONSTRUCTION EQUIPMENT ADVERTISERS AND IS BASED ON THE "SOUND PLAN" OF THE AMERICAN ROAD BUILDERS' ASSOCIATION

Make no Little Plan

for POSTWAR HIGHWAYS

CURRENT ROADBUILDING NEEDS

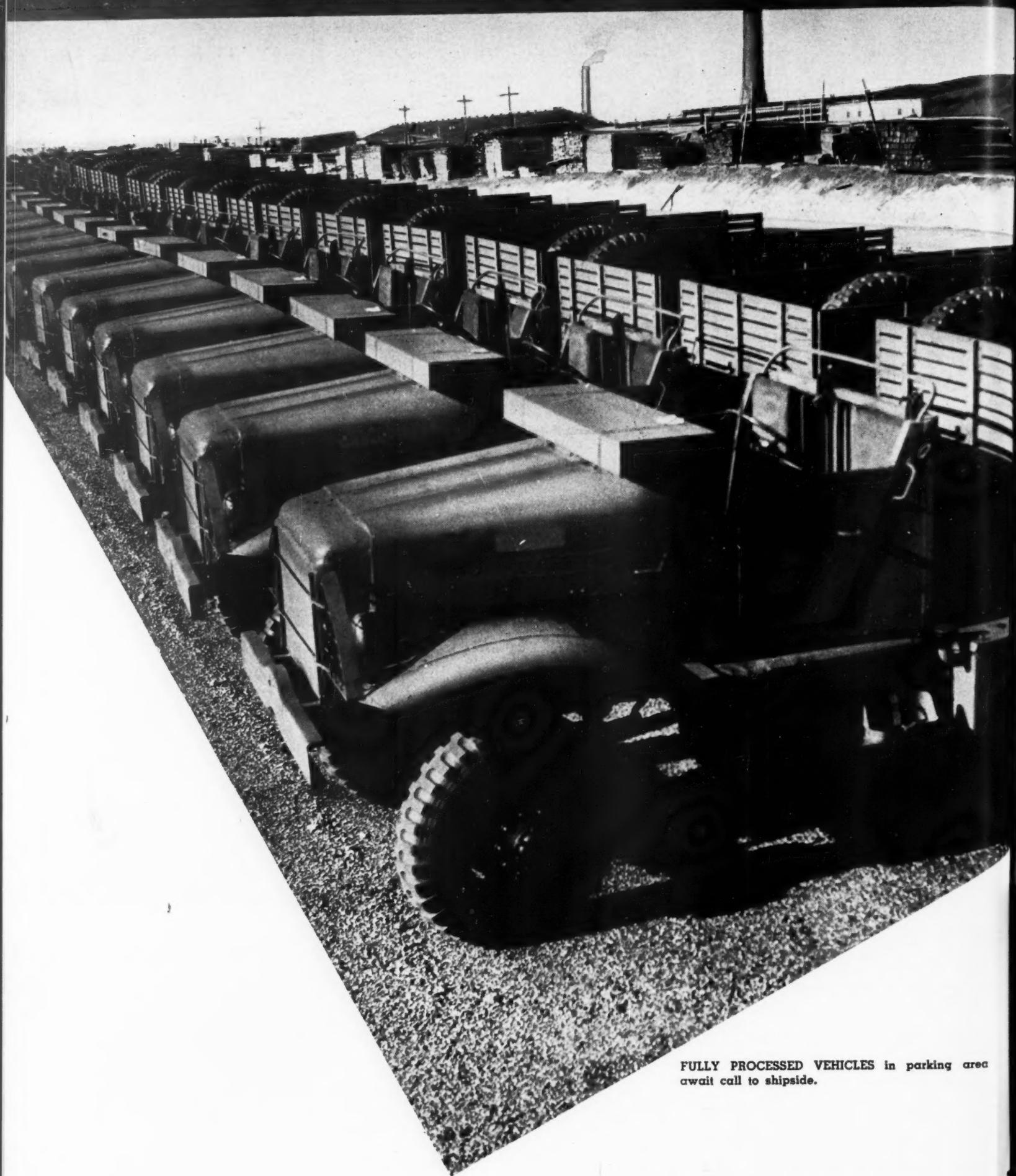
1. Required projects for mobilizing existing transportation and bridge facilities EXCLUDING the Federal Aid Highway System (including 18,000 miles of Federal Aid Highway)	\$15,000,000,000
2. Needs for eliminating 5000 (or less) traffic jams along the State highway system (not linked crossways) in present-day traffic patterns (Growth, increasing, necessitated by present-day traffic conditions)	1,000,000,000
3. Metropolian traffic relief through new express highways connecting city to city (about 300 miles of urban-city connections; 100 miles of suburban highways)	3,000,000,000
4. Urgent or needed reconstruction on the 106,000 miles of roads required to restore 15,000 other or older roads	3,000,000,000
5. Required maintenance, reconstruction, and rehabilitation of roads and bridges in rural areas (rural roads)	4,000,000,000
6. Maintenance programs for rural roads and highways	260,000,000
Total for work need in highway field (five years)	\$19,250,000,000

CURRENT ROAD-BUILDING NEEDS, totaling \$19,250,000,000 for the first five post-war years, are featured at annual convention of American Road Builders' Association, in Chicago, Jan. 16-19, in exhibit prepared in cooperation with construction equipment manufacturers.



JEFFERSON BARRACKS BRIDGE (right), recently dedicated, spans Mississippi River to complete outer belt highway around St. Louis metropolitan area. Owned and operated as toll structure by St. Louis County, it was constructed by Massman Construction Co., of Kansas City, and designed by Sverdrup & Parcel, consulting engineers, of St. Louis. Structure carries roadway 24 ft. wide. Its overall length is 3,626 ft. Viaducts over railroad tracks on east approach are still under construction.

Production-Line "Processing"



FULLY PROCESSED VEHICLES in parking area await call to shipside.

"At Embarkation Port Prepares Trucks and Heavy-Duty Mobile Equipment for Overseas Shipment... Sprayed Film Prevents Rust

PROTECTION OF METAL SURFACES by a sprayed-on rust-preventive film, thorough mechanical and electrical inspection, checking and servicing, complete lubrication, oiling and paper wrapping of metal parts, sealing of joints and openings with masking tape and safeguarding of critical parts of machines from breakage by plywood barricades, are features of the production-line technique developed by the Transportation Corps at the Army's Hampton Roads (Va.) Port of Embarkation for preparing motor trucks, heavy-duty construction equipment, tanks, locomotives and artillery (from 37 to 240-mm. guns) for shipment overseas and for storage, often without shelter, prior to being placed in service. The processing is applied to all types of general purpose vehicles for use by the Engineer, Signal, Ordnance Corps and Field Artillery.

Vehicles are shipped overseas in all climates and to all ports, as deck-cargo as well as hold-cargo. For this reason wind, weather, salt, dampness, and corrosion must be taken into account for the processing procedures, which have been tested and retested, checked and rechecked in order to bring as near to perfection as possible the Transportation Corps technique of preserving army mobile equipment.

The processing of vehicles for over-

seas shipment started at Hampton Roads Port of Embarkation soon after the port was activated in the summer of 1942. At that time a mobile processing unit was used, operating out in the open street. From that elementary beginning has grown the present setup, with its complete coverage and production-line technique designed to enable the vehicles to withstand not only long sea voyages, but also possibly long periods of storage after their arrival overseas, as happened prior to the invasion of Europe, when vast stockpiles of vehicles were being built up.

Signal Corps Photos



In comparison with the job done today, processing in the beginning was fairly cursory, though probably adequate for vehicles to be shipped in the holds of vessels for short trips. As experience has grown and data become available on the condition of vehicles arriving at overseas destinations, the processing job has widened greatly and probably will, within rather narrow limits, continue to widen until the very end of the war.

Vehicles to be sent overseas may either be shipped in by rail or driven in. No processing for overseas shipment has

OPERATIONS ON RAMP... STATIONS 1 to 10

1 HIGH-PRESSURE WATER SYSTEM (below) removes all mud and clay from vehicle at washing station before driving over processing ramp.



2 ENGINE COMPARTMENT, chassis, front and rear axle assemblies, transmissions and transfer cases (below) are thoroughly cleaned with steam and solvent. Then entire vehicle is washed with clear water. (Stations 1 and 2)





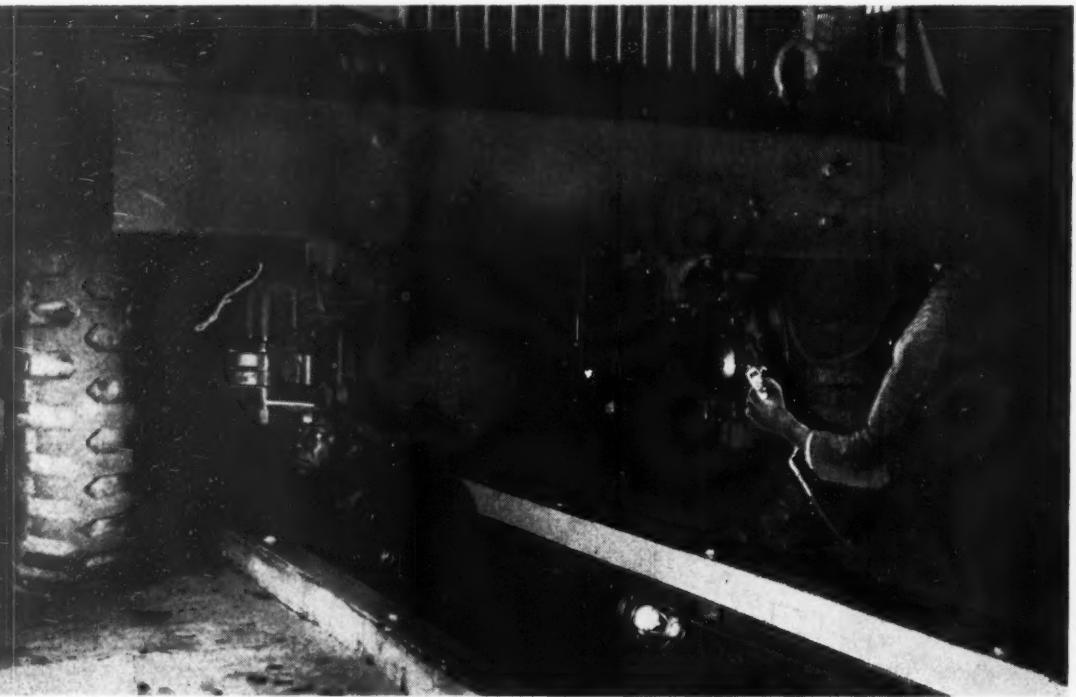
3 WHEEL LUGS are tightened, air cleaner removed and cleaned and cooling system checked for leaks and to prevent damage by freezing. (Station 3)



4 ENGINE ACCESSORIES and upper hardware are lubricated. All undercarriage bolts and nuts are tightened. Brake fluid is checked and, if necessary, replenished. (Stations 4 and 5)



5 TIRES ARE INFLATED to 10 lb. above normal pressure. Transmission, transfer cases, differentials and final drive assemblies are filled to required level. (Stations 6 and 7)



6 UNDERCARRIAGE is lubricated and all clevis pins, yoke connections, ball joints and springs are sprayed with medium lubricating preservative oil. (Station 8)

been done by the manufacturer in either case. According to the official statement of the Transportation Corps the purpose of processing is:

"To provide a procedure in the preparation of ordnance material for shipment to the various theaters of operations overseas, which will prevent damage, corrosion or deterioration of the vehicles while en route. The materiel must be in such a condition upon arrival at its destination that it may be placed in service with a minimum expenditure of time and labor.

"Shipments overseas, being exposed normally for long periods of time and under severe conditions, must be prepared to stand the effects of the following situations: (1) Temperatures of -40 deg. F. to +130 deg. F. and varying humidity; (2) intermittent contact with seawater when deck-loaded; (3) uncertainty of the extent of period of transit."

When the processing line is in full production for general purpose vehicles, a vehicle comes off the line every 8 min. About 130 people, mostly civilian girls and men, work on the production

Page 68

7 CRANKCASE (below) is drained and refilled with oil engine preservative. (Station 9)



8 THIN FILM OF RUST PREVENTIVE (below) is sprayed on entire undercarriage, universal joints, upper hardware and all other vulnerable places. (Station 10)



FINAL PROCESSING LINE...STATIONS 1 to 12

line that moves the vehicles through the processing job. For general purpose vehicles, about 13.3 man-hours of work are required for vehicles from $\frac{1}{4}$ ton up to and including 7½ tons. For special purpose vehicles (such as 2½ ton amphibians, mobile machine shops, repair shops, 4- to 10-ton wreckers) 21 man-hours of labor are required on the average. Warehouse-tractors are used for towing and pushing the vehicles along the final processing line.

Metal surfaces of all major parts of wheeled vehicles, track-laying vehicles, artillery, and other heavy-duty construction equipment are protected from cor-

rosion during shipment overseas and subsequent storage, frequently without shelter, such as deck loads, by spraying with a protective film, applied cold. This rust-proofing coat dries within approximately one hour after application. It is known as Par-Al-Ketone, Army Specification Number AXS 673, lead base, and is manufactured by leading petroleum companies. This coating serves a dual purpose, protecting during transit the metal portions of the vehicle that have been treated, and also affording excellent protection while in actual use.

When vehicles arrive at an overseas port they may have to be driven away in

a hurry, either because of the immediate need for the vehicles themselves or because danger of bombing or other attack is imminent. For these reasons speed of deprocessing at the final destination is a major factor in the methods of processing. As processing is now carried on, deprocessing of general purpose vehicles takes, on the average, only about 20 min. All that has to be done at the port of debarkation is to strip off the masking tape, rip off the plywood barricades on radiator and windshield, tighten up the fan belt, connect the batteries, fill the gas tank and drive off. Most of the other processing, consisting as it does of rust-



9 ENGINE PRESERVATIVE OIL is sprayed into carburetor air intake (left) with engine running. Spark plugs are removed and few ounces of preservative oil are sprayed into each cylinder. (Stations 1 and 2)



10 BATTERIES (right) are checked to determine if fully charged. Lead terminals are disconnected, cleaned and taped and terminal posts are cleaned and greased with rust preventive compound. (Station 3)



11 GREASEPROOF WRAPPING and adhesive, non-hygroscopic tape (below) are used to cover carburetor, distributor coils and other engine accessories. (Stations 4, 5 and 6)



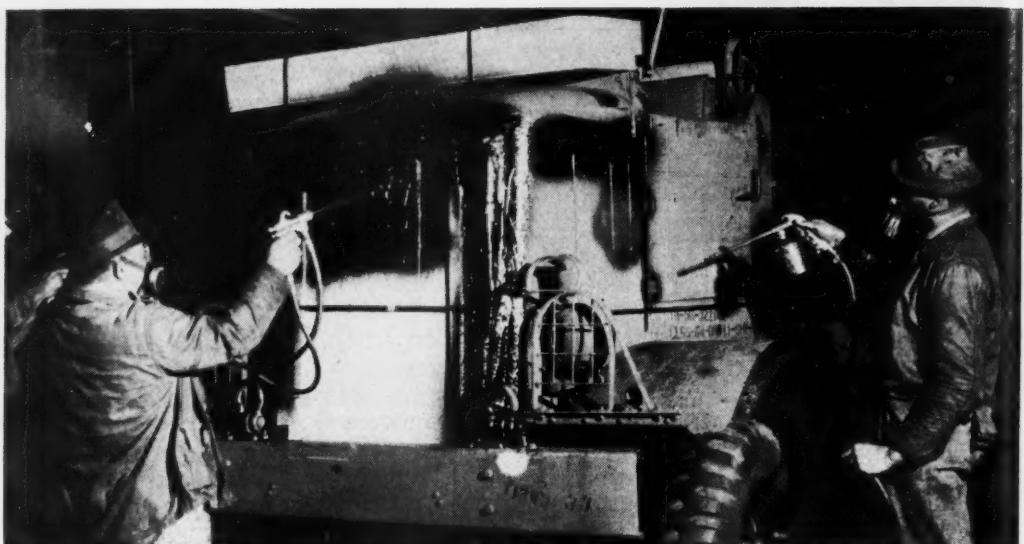
12 IGNITION INSULATION COMPOUND (below) is sprayed on entire engine compartment and exterior of engine, including all components. (Station 7)



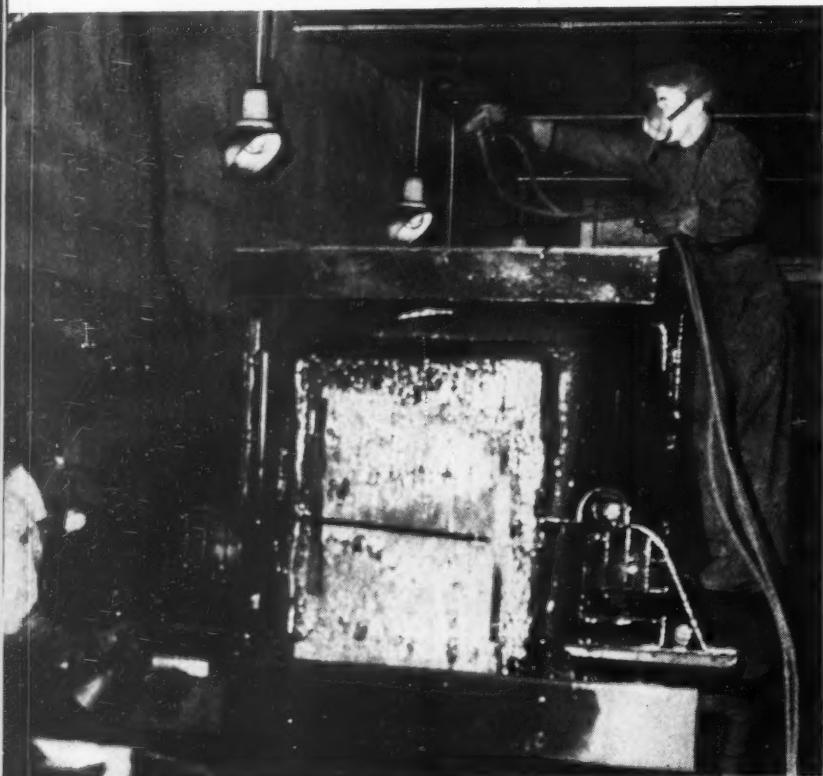
13 PLYWOOD BARRICADE is securely fastened with steel strapping to protect all exposed glass and radiator front. Plywood is $\frac{1}{4}$ in. thick. (Station 9)



14 ENGINE HOODS, louvers and radiator barriques are sealed with waterproof paper and non-hygroscopic tape. (Station 10)



15 ALL PAPER AND TAPE on exterior of vehicle is coated with sealing compound. (Station 11)



16 HEADLAMPS, barriques and other exposed parts (left) are painted with olive drab lusterless enamel. (Station 12)

preventive measures, need not be removed and is in fact of value after the vehicle has been put into operation overseas.

At Hampton Roads Port of Embarkation, commanded by Brig. General John Reed Kilpatrick, the Transportation Corps knows that its overseas processing of vehicles is effective. Constant checks and reports are received on vehicles from ports of debarkation. In addition, Lieut. Col. Eugene S. Smith, director of the facilities and supply division, spent several months abroad during the last year inspecting HRPE equipment in ports and warehouses. As a result there is no guesswork in the processing.

Operations Preliminary to Processing



Tools and chains are dipped in lubricating preservative oil, wrapped in waterproof paper and boxed with tarpaulin. Boxes are lined, bottom, four sides and top, with heavy waterproof paper. The top cover extends 2 in. beyond the sides and ends of the box and is tacked to the sides and ends of the box as further waterproofing protection. A packing list is placed inside of the box and one is also fastened to the outside cover. Whenever practical, boxes, equipment and so forth are placed within the body of the vehicle and are secured in position with steel sealing tape. All removable gear and equipment on wreckers is processed with rust preventive compound, then wrapped with waterproof paper and secured.

A thorough mechanical and electrical inspection is made of each complete vehicle or component parts, major unit assemblies, accessories or parts, to determine correctness of operation, defects or deficiencies. The engine is test-operated; all necessary repairs are made and inspected. The equipment is not released until it is complete, including all modifications, and in a serviceable condition. If any mechanical deficiencies

17 WAREHOUSE TRACTOR (below) is used to tow or push vehicle along final processing line.



are discovered during the processing operation, the vehicle is immediately returned to the automotive shop. "On vehicle" materiel is checked for completeness and all shortages are made up.

Used vehicles, with a few thousand miles on them, are often sent overseas. Such vehicles are put into condition as closely as possible approximating that of a new vehicle upon receipt from the manufacturer. In other words, all motor vehicles must be in a completely serviceable condition for combat before they are processed for overseas shipment.

Ramp Operations

Before driving over the ramp, the vehicles are completely washed by high pressure water system and all mud and clay are removed. The driver of the vehicle removes the windshield wiper blades, wraps them in heavy waterproof



18 AFTER PROCESSING, vehicle is towed to outbound park to await call to shipside.



paper and tapes them to the steering column.

Station 1—The entire undercarriage is steam-cleaned with steam and solvent. When necessary the engine is also steam cleaned. Final steam-cleaning of the engine is accomplished with the use of steam only, the solvent valve being closed. Caution is used to prevent the steam-solvent from being directed on the electrical system.

Station 2—Entire vehicle is washed with clear water to remove all traces of solvent, then the chassis is washed with steam only. Windows and windshield are also washed.

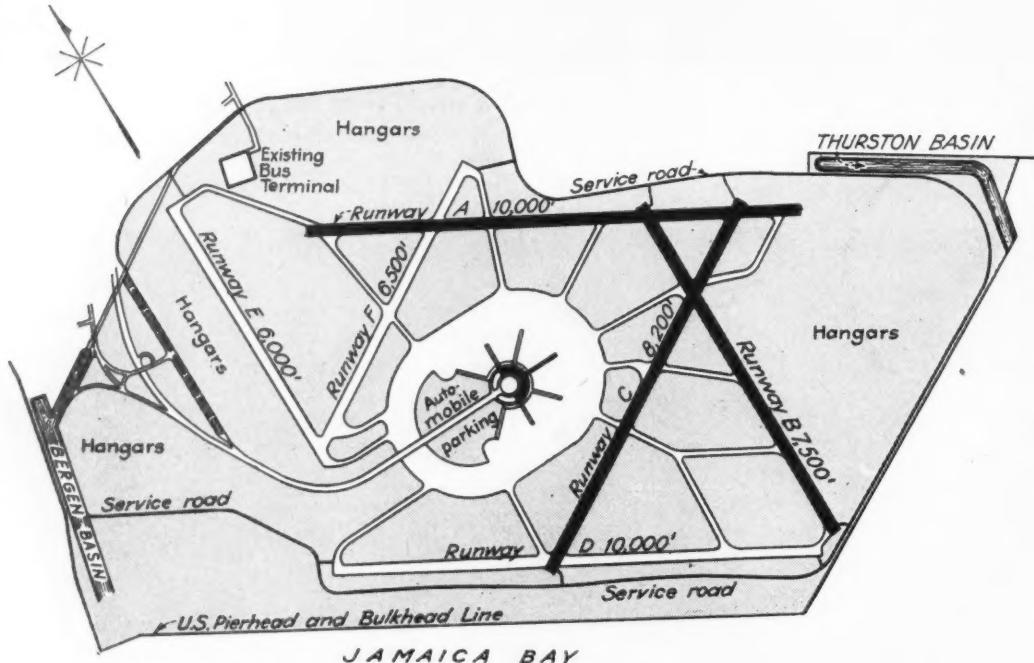
Station 3—Radiator solution is checked for anticipated temperatures (60 deg. F. below zero). One tag indicating the type
(Continued on page 162)

19 & 20 HEAVY CONSTRUCTION EQUIPMENT, such as trench excavator and tractor-bulldozer (above) and power shovel (below), that cannot be unloaded from cars is processed at piers or at outbound park by mobile processing maintenance unit.



World's Largest Airport

Has 12-In. Concrete Runways on Dredged Sand Fill
To Carry Heavy Plane Loads



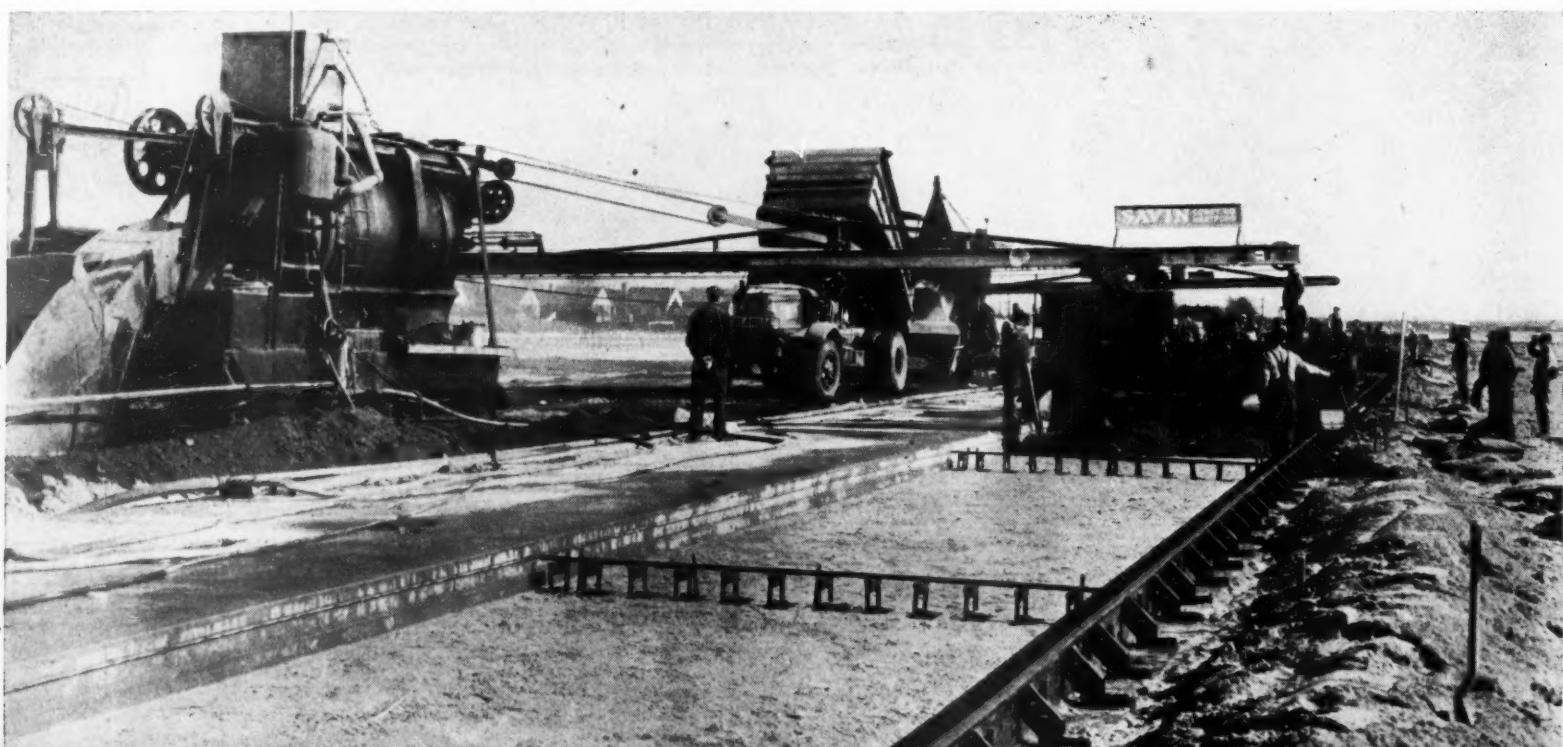
FIRST STAGE OF CONSTRUCTION for New York municipal airport at Idlewild on area of 4,495 acres, built up with 41,000,000 cu.yd. of hydraulic sand fill, calls for six runways totalling 9 mi. in length, of which runways A, B and C already are under contract, connected by taxiway system 5.6 mi. long to 306-acre central paved apron. Eventual development involves second stage of construction for six additional runways equal in length to first six. Runways are 200 ft. wide, paved with reinforced concrete 12 in. thick, designed for 150-ton plane load. For apron and runways, 100 ft. wide, where static loads and effect of vibration will be greater, pavement thickness is to be 14 in.

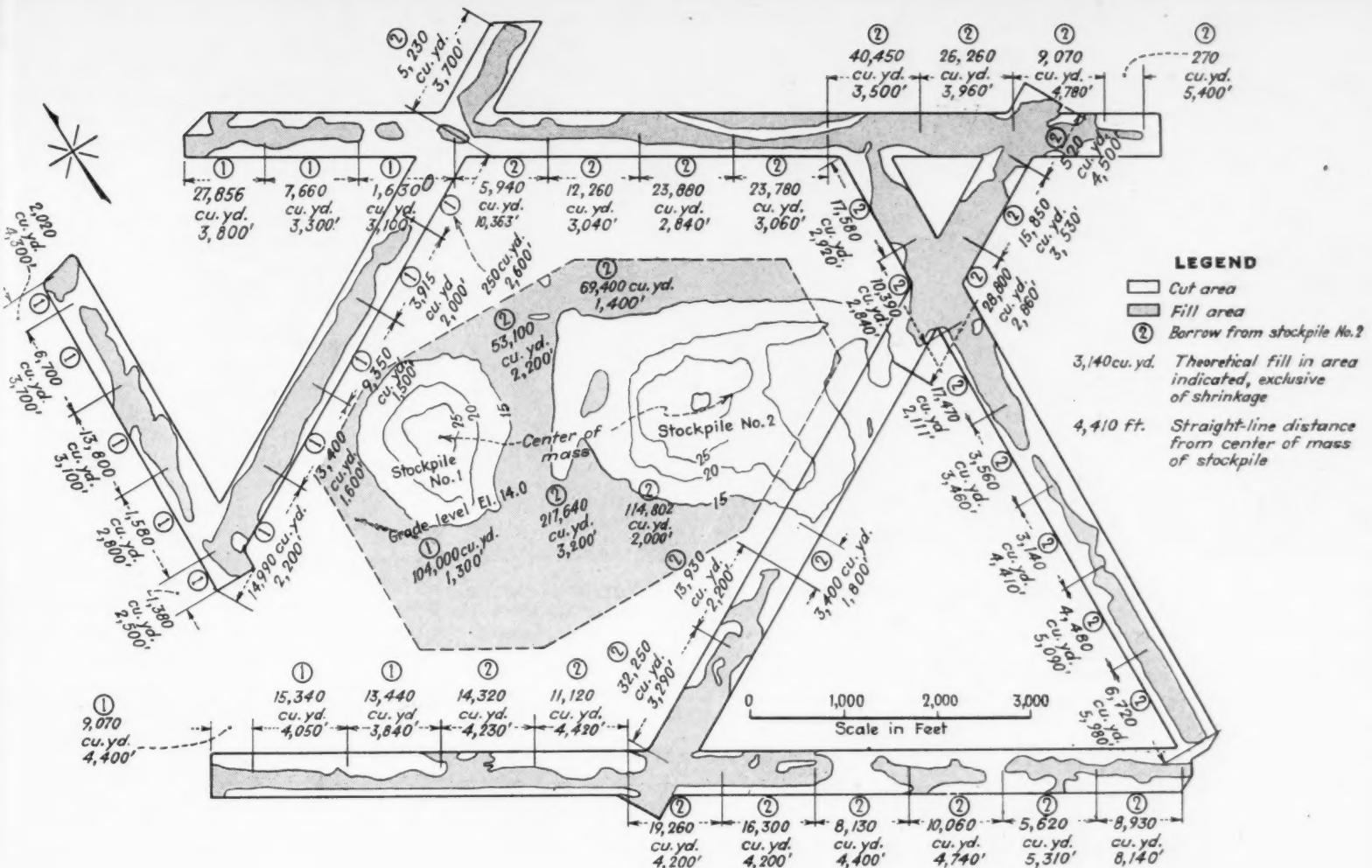
DIMENSIONS AND QUANTITIES in keeping with the future operating capacity of the field characterize design and construction of the world's largest airport by the City of New York at Idlewild on Jamaica Bay, in the borough of Queens, 12 mi. from LaGuardia Field and 13 mi. from Grand Central Terminal. Covering an area of 4,495 acres, with major dimensions nearly $4\frac{1}{2} \times 2\frac{1}{2}$ mi., the site already has received 37,000,000 cu.yd. of hydraulic sand fill, to which 4,000,000 yd. more is being added at a rate exceeding 1,000,000 yd. per month, to raise the grade of the original salt-water meadows 7 ft. above mean high tide in the bay and provide a stable foundation for runways, taxiways and aprons. Contracts now in progress for 2,500,000 cu.yd. of grading and 570,000 sq.yd. of reinforced-concrete pavement 12 in. thick, on three runways up to 10,000 ft. long, are scheduled for completion in time to permit commercial operation by September at a restricted rate equal to that of LaGuardia Field, where more than 300 plane movements, total in and out, are handled in 24 hr.

Six runways, shown on an accompanying layout, are included in the first stage of construction for the new municipal airport. A second stage of construction

Page 72

TWO 34E PAVING MIXERS (below) place 36-cu.ft. batches in 12½-ft. lane for reinforced-concrete pavement 12 in. thick. Dual-drum machine at left places 8-in. lower course of pavement, on which welded wire reinforcing mesh is laid, and single-drum paver in background deposits concrete for 4-in. top course. In foreground are load transfer devices installed at locations of transverse contraction joints 40 ft. apart.





GRADING PLAN of this type, made available by engineers to all bidders on 2,500,000-cu.yd. grading contract, enables estimators to calculate costs on accurate basis for determination of bid prices. From two stockpiles of sand previously built up by dredging contractors, holder of grading contract must move material to six runway areas. This diagram shows, for each section of runway, engineers' estimate of fill required and straight-line distance to section from center of mass of stockpile. Five runways are graded 500 ft. wide, and sixth, at south side of field, is graded to 550-ft. width.

later will provide six more runways, increasing the peak-load capacity of the field to 300 movements, total of arrivals and departures, per hour. Exclusive of hangars, which it is planned will be provided by the airline operators, the cost

of the first stage of development is estimated at \$71,000,000, of which \$30,100,000 is for fill, grading, paving, drainage and utilities, \$10,000,000 for an administration building, \$1,000,000 for two smaller buildings and \$2,730,000 for

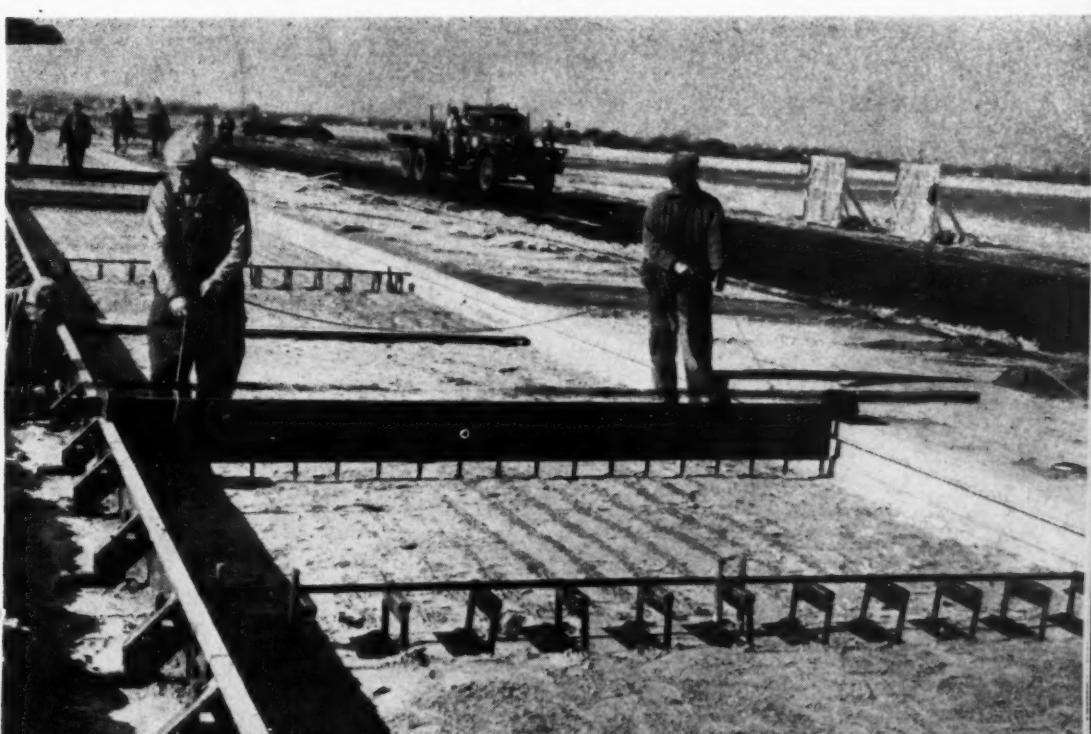
roads and bridges. Eventual total cost of the complete development is expected to approach \$100,000,000.

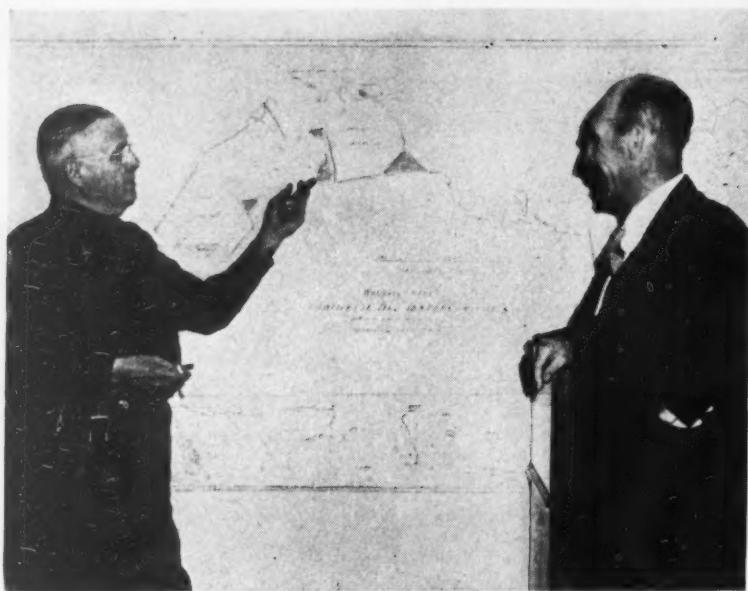
Contracts awarded by the city since it undertook construction of the airport in the spring of 1942 are listed in an ac-

STOUT STEEL FORMS of No. 5 gage sheet, with 12-in. header and 12-in. base, are accurately adjusted to line, grade and horizontal plane, as indicated by checking top rail with spirit level.

Page 73

BETWEEN LOAD TRANSFER UNITS (below), already in position at locations of transverse joints, workmen operate scratch template to check subgrade profile.





WORKING PLAN for hydraulic fill, contract No. 5, is analyzed by E. J. (Jack) CARRILLO (left), field engineer for Jay Downer and Wharton Green, consulting engineer and associate, in discussion with H. F. SCHOON, general superintendent, Atlantic, Gulf & Pacific Co.



HIGH-CAPACITY PAVING PLANT is adapted to fast airport paving operation during fall by A. I. SAVIN (right), president of A. I. Savin Construction Co., in preparation for adding second outfit of same size this spring.

CITY CONTRACTS, NEW YORK MUNICIPAL AIRPORT

Contract	Description	Contractor	Date awarded	Specified completion	Percentage completed, Feb. 1, 1945	Estimated cost
No. 1	Hydraulic fill, 16,000,000 cu. yd.	Gahagan Construction Corp., New York	April 21, 1942	16 months	100	\$3,198,400
Supplement	7,000,000 cu. yd.	ditto	May 13, 1943	7 months	100	608,877
No. 3	Grading and beach grass	Peter Mitchell, Inc., Greenwich, Conn., and D. T. Small, Inc., White Plains, N. Y.	June 10, 1943	Jan. 1, 1944	100	247,500
No. 4: Option 1	Hydraulic fill, 3,000,000 cu. yd.	Gahagan Construction Corp.	Jan. 6, 1944	May 1, 1944	100	694,500
Option 2	Hydraulic fill, 3,500,000 cu. yd.	Atlantic, Gulf & Pacific Co., New York	Jan. 6, 1944	Oct. 1, 1944	100	556,500
No. 5	Hydraulic fill, 8,500,000 cu. yd.	Atlantic, Gulf & Pacific Co.	Aug. 15, 1944	July 24, 1945	65	1,926,950
No. 6	Grading, 2,500,000 cu. yd.	Circle Construction Corp., White Plains, N. Y.	Aug. 19, 1944	June 7, 1945	38	725,000
No. 7	Concrete paving, 570,000 sq. yd.	A. I. Savin Construction Co., East Hartford, Conn.	Sept. 26, 1944	Sept. 1, 1945	3	2,203,945
No. 9	Sewers	Nicholas DiMenna Co., New York	Jan. 30, 1945	210 days	0	821,862
No. 10	Sewers	Andrew Catapano, Glendale, N. Y.	Jan. 30, 1945	210 days	0	1,147,116

Prior to city's taking over project, Gahagan Construction Corp. had placed 3,000,000 cu. yd. of hydraulic fill for Corps of Engineers, U. S. Army.

TRANSVERSE BLADING SPREADER (below), distributes concrete across width of 12½-ft. lane and strikes it off to 8-in. depth for first layer of pavement. Multi-vane spreading device travels back and forth across machine as unit moves forward; at each extremity of travel path, device makes partial rotation as it changes direction of movement.



companying table. Just prior to the city's taking over the site, the Corps of Engineers, U. S. Army, had placed 3,000,000 cu.yd. of hydraulic fill on a portion of the area under a contract awarded Feb. 1, 1942, to provide a foundation for an interceptor field. Later contracts by the city have increased the total quantity of hydraulic fill to 41,000,000 cu.yd.

Large-capacity construction plants, skillfully manipulated and maintained in the face of war conditions, have marked the operations of the dredging, grading and paving contractors. Great quantities of materials have been moved at sustained high rates by the contractors for dredging and grading. On pavement construction last fall, the paving contractor operated two 34E mixers, one dual-drum and one single-drum, and a second outfit of the same capacity will be employed when work resumes this spring. Paving operations had to be discontinued Nov. 17, after less than 20 working days, because of unfavorable weather conditions in the exposed location.

Responsibility for design and construction of the airport rests with Jay Downer, consulting engineer, and Wharton Green, associate, of New York, engaged for this work by the Department of Marine and Aviation, John McKenzie, commissioner, and Elmer R. Haslett, director of airports. For the consultants, M. T. Decker is chief of design, and E. J. Carillo, field engineer, is in charge of all operations at the airport.

Conditions at Site

Selection of the site was determined by the fact that the broad expanse of salt meadows bordering Jamaica Bay at the southeast corner of Queens provided the only open area within the city limits large enough to accommodate an airport of the size contemplated. Fine sand fill 7 to 10 ft. deep has been deposited by the dredge lines on the meadows to build up the grade of the site to average El. 12, or 7 ft. above mean high water at El. 5. The fill went on top of about 1½ ft. of muck and organic matter resting on 5 to 6 ft. of mud mixed with some sand, underlaid by a solid bottom of beach sand. No mud waves or lateral displacement of the original material occurred during the filling. As disclosed by 47 steel settlement plates 18 in. square installed on the original soil at selected locations throughout the area, subsidence of the underlying material was completed in four months, when the fill became stabilized. Under a fill load of 900 lb. per sq.ft., the settlement was about 2 ft.

To note fluctuations of the water table, the engineers installed 30-in.-dia. observation wells at 65 locations. The fine sand fill is relatively impervious, and the rate of seepage is slow. As an aid to later grading operations on the field, the dredging contractors built two stockpiles containing 2,400,000 cu.yd. of sand, to about El. 30. Groundwater stored by these stockpiles produced a domed profile in the water table and maintained

the general water level during construction above El. 9, where it is expected to stabilize when grading is completed.

Because the sand is not self-draining, the airport design includes sewers to carry away runoff from the large paved areas. To provide capacity at the slight gradient available, the sewers are of large diameter, with outfalls mostly of 72-in. size. Two sewer contracts have been awarded to provide permanent storm-water outlets for borough drainage.

Dredging Operations

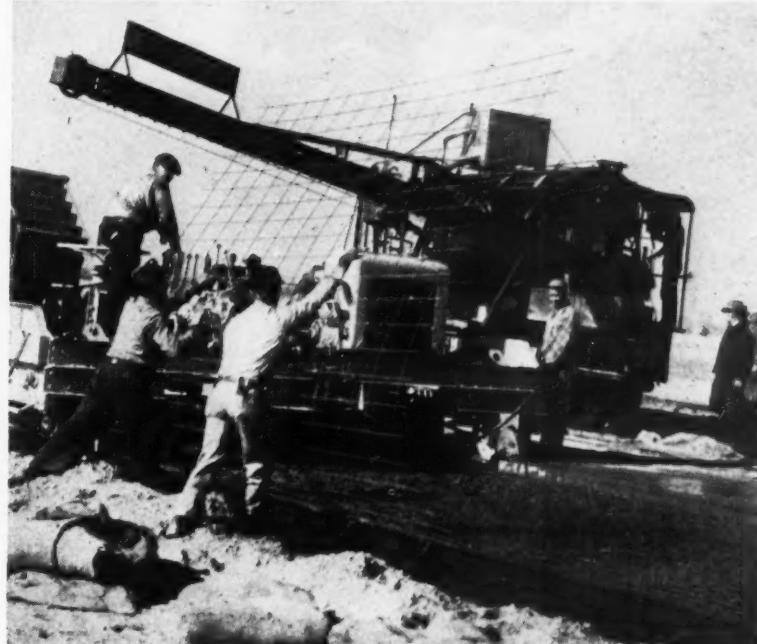
Material for the sand fill was obtained principally by dredging for a ship channel and seaplane landing area 13,000 ft. long by 2,500 ft. wide and 30 ft. deep through the sand bars and shoals of Jamaica Bay adjoining the south side of the field. Including work performed for the Army in the spring of 1942, the Gaghan Construction Corp., New York, placed 26,000,000 cu.yd. in 23 months, an



FLEXIBLE-SHAFT INTERNAL VIBRATOR mounted at rear of spreading machine is used to vibrate concrete adjacent to load transfer devices at expansion joints and along two edges of slab.



FIRST ASSISTANT on engineering staff at airport is ARTHUR F. ROGERS, deputy field engineer, here studying subsurface data for sewer location.

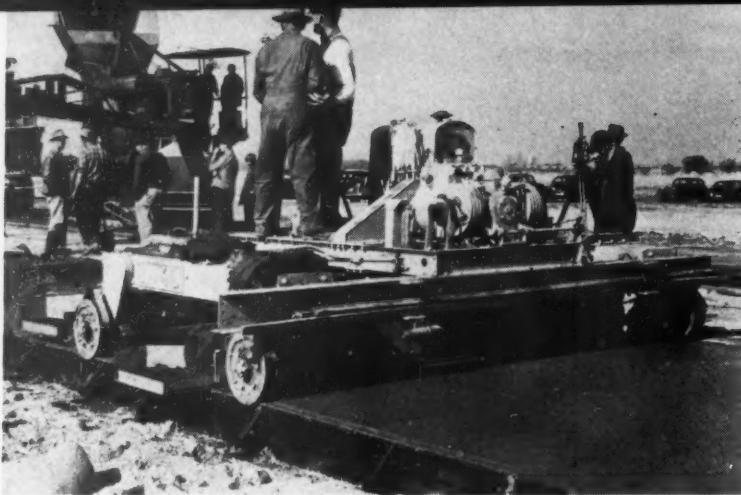


ON TOP OF 8-IN. LOWER COURSE of concrete pavement, workmen place welded wire mesh reinforcement made up in mats about 14 ft. long.

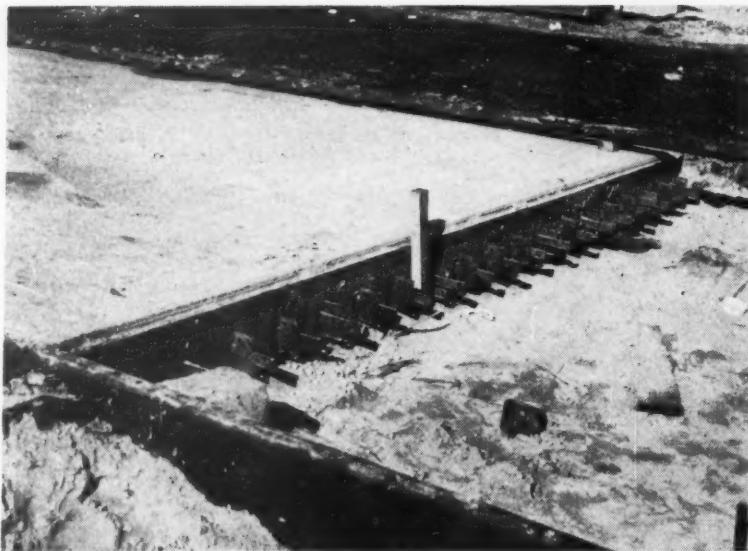
average of better than 1,000,000 yd. a month, and later added 3,000,000 cu.yd. under Option 1 of Contract 4. The contractor kept two dredges in operation on the job. During the first eleven months, the operating units consisted of dredge No. 5, 27-in. pump (31-in. suction) steam-turbine-driven through reduction gears, 500-hp. electric cutter drive; and dredge No. 2, steam-powered, 18-in. pump (20-in. suction). For the remainder of the job, dredge No. 2 was replaced by the electric dredge Nebraska, 30-in. pump (34-in. suction) direct-connected to motor rated 4,000 hp., electric cutter drive rated 500 hp. To reach the job, the latter dredge was disassembled at Kingsley Dam, Neb., and shipped by rail on 40 cars to Albany, where it was reassembled and towed down the Hudson River and

TOP 4-IN. LAYER of 12-in. concrete pavement (below), covering welded wire mesh reinforcement, is struck off and finished by two-screed finishing machine.

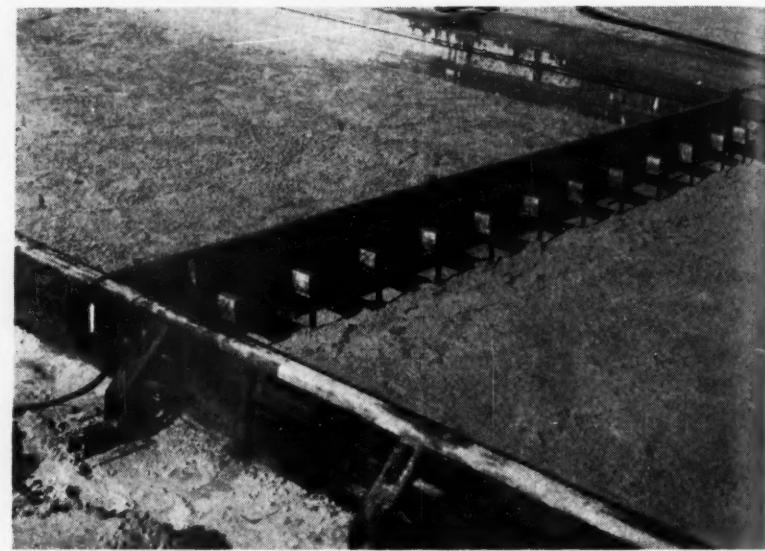




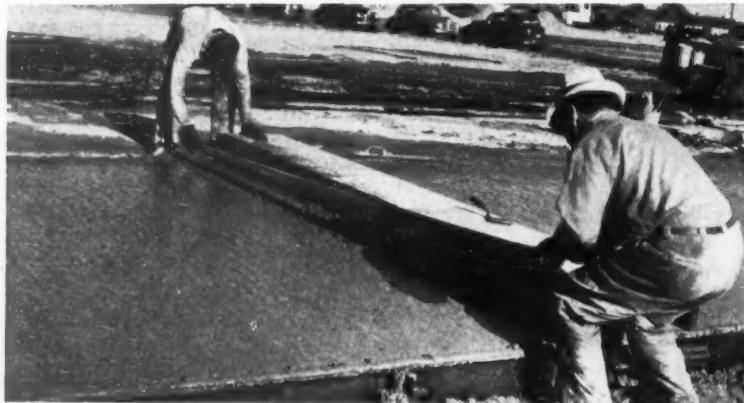
REAR SCREED ONLY (left) is in contact with pavement surface on second pass of finishing machine, imparting finish indicated by condition of surface at right.



LOAD TRANSFER DEVICES of three types are installed in runway pavement constructed during fall of 1944. This expansion joint illustrates one type, used also at contraction joints. All expansion joints use 1-in. cork filler.



SECOND TYPE of load transfer dowel is employed in this expansion joint, installed on subgrade with steel protective cap in place on cork filler, ready for placing of concrete pavement.



AFTER PASSAGE OF FINISHING MACHINES (above), finishers remove steel cap from cork filler at transverse expansion joint.

TEMPORARY STEEL BAR of proper cross-section (below) is installed in slot to mold transverse contraction joint while concrete hardens.



LONGITUDINAL FLOAT MACHINE (right), removes any lengthwise irregularities from surface with reciprocating screed which travels transversely back and forth across pavement while entire unit moves forward.



SAWTOOTH STEEL BLADE mounted in manually operated steel holding device cuts slot 3 in. deep for transverse contraction joint above load transfer dowels embedded in concrete.



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around the western end of Long Island into Jamaica Bay.

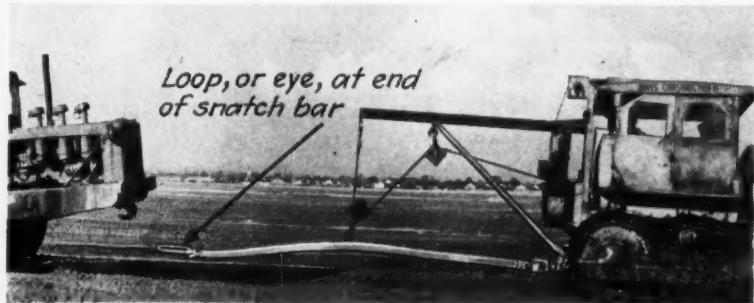
Fill placed by the Gahagan dredges was pumped through pipelines ranging from about 3,000 to 13,000 ft. in length. The pumps delivered an average of 12½ percent solids, with a maximum-minimum range of 28 to 5 percent, depending on the length of the lines and the character of the pumped material.

A dredging contract totalling 8,500,000 cu.yd. of the Atlantic, Gulf & Pacific Co., is being completed by that company's dredge *Baltimore* and by the *Lake Fithian* of the Standard Dredging Co., New

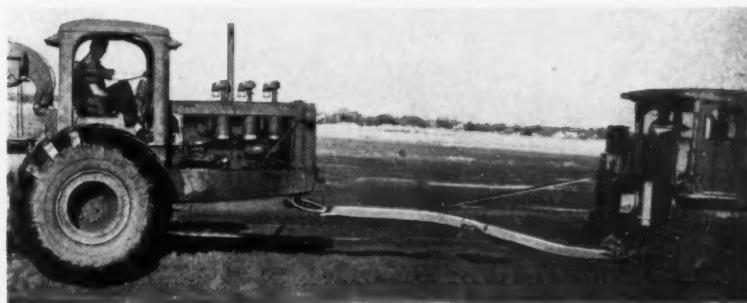


FOR LONG HAULS up to a mile or more in length, grading contractor operates fleet of 14 pneumatic-tired tractor-scaper units carrying 15-yd. heaped loads at speeds up to 15 mph. over haul roads maintained in good condition by tractor-drawn, multiple-blade drag visible in distance.

GRADING CONTRACT of 2,500,000 cu.yd. is supervised for Circle Construction Corp. (right), by **GEORGE H. SCHUMACHER** (left), chief engineer, here talking with **LESTER MALM**, in charge of grading for airport consultants.



SNATCH LOADING of pneumatic-tired tractor-scaper combinations by means of puller attachments mounted on pulling tractors (used instead of pusher tractors) keeps scraper units moving ahead in straight lines while loading and averts danger of jack-knifing. Two types of contractor-built devices for this job operate on same principle: Puller bar equipped with large eye at rear end is raised and lowered by power control unit on pulling tractor; eye is raised to make contact with hook at front end of pneumatic-tired tractor and is lowered to break connection after loading is completed.



York, to which the prime contractor assigned 3,000,000 cu.yd. of fill on the north side of the airport. The *Baltimore*, a steam dredge of about 3,000 hp. with a 27-in. turbine-driven pump (30-in. suction) placed 1,300,000 cu.yd. in a working month of 520 operating hours through a discharge line about 2,500 ft. long. Smaller yardages are placed by this dredge as its lines lengthen up to a maximum of about 10,000 ft.; the average is about 6,000 ft. The *Lake Fithian* is a steam dredge of nearly 5,000 hp. equipped with a 27-in. turbine-driven pump (30-in. suction) of about 3,500 hp. Pumping through a discharge line of 16,800-ft. extreme length without a booster, this dredge placed 550,000 yd. in one month of 520-hr. working time.

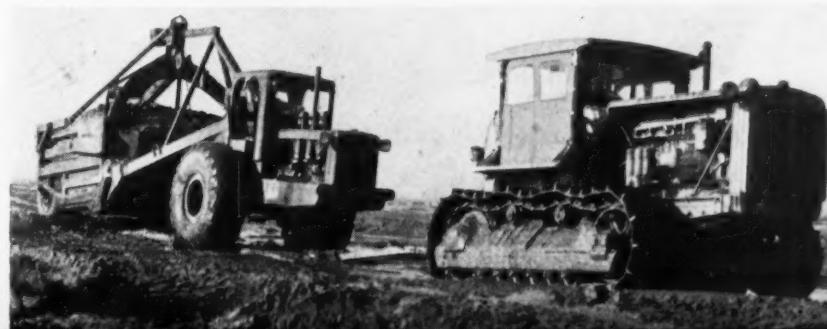


PULLING TRACTOR attached by hook-and-eye connection to front end of pneumatic-tired unit supplies needed additional power for gathering heaped load of sand into scraper, as shown by example in background, loaded by same method.

Airport Grading

Reproduced with these notes is a simplified copy of a grading plan furnished by the engineers to all bidders on the 2,500,000-cu.yd. grading job. This contract involved movement of 2,400,000 cu.yd. of sand out of two stockpiles to furnish about 1,600,000 yd. of consolidated fill (making allowance for 33 percent shrinkage) on the six runway locations and, in addition, called for nearly

AFTER COMPLETING LOADING OPERATION (below), pulling tractor reduces speed slightly to disengage eye from hook, while operator of loaded unit lifts bowl and increases speed.





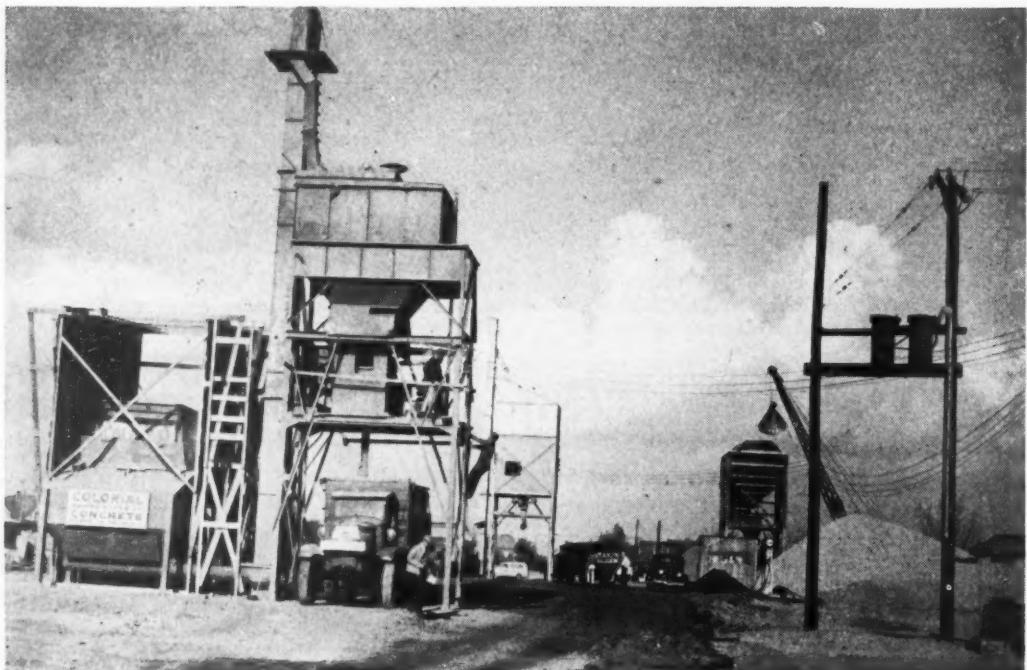
CONCRETE PAVING gets off to good start in fall of 1944 under direction of JOHN W. (Jack) DAVIS (left), chief concrete technician for airport engineers, and PROCTOR P. COOK, superintendent for A. I. Savin Construction Co., contractor.



AIRPORT PAVING ACTIVITY brings together this group of interested specialists (left to right): JOHN W. DAVIS, chief concrete technician; R. B. DILLENBECK, paving consultant; ELLIOTT HALLER, Haller Engineering Associates; DUFF A. ABRAMS, famous concrete engineer, visitor to project; and General Superintendent D. R. BELSOLE, Vice-President FRANK L. KELLY, and Concrete Technician E. A. ROBINSON of Colonial Sand & Stone Co.



TRACK-LAYING TRACTORS operate fleet of 15 scrapers used for shorter hauls ordinarily within 1,200-ft., and never exceeding 2,000-ft., one-way distance. Pusher loading with aid of tractor-bulldozer reduces loading time and increases yardage.

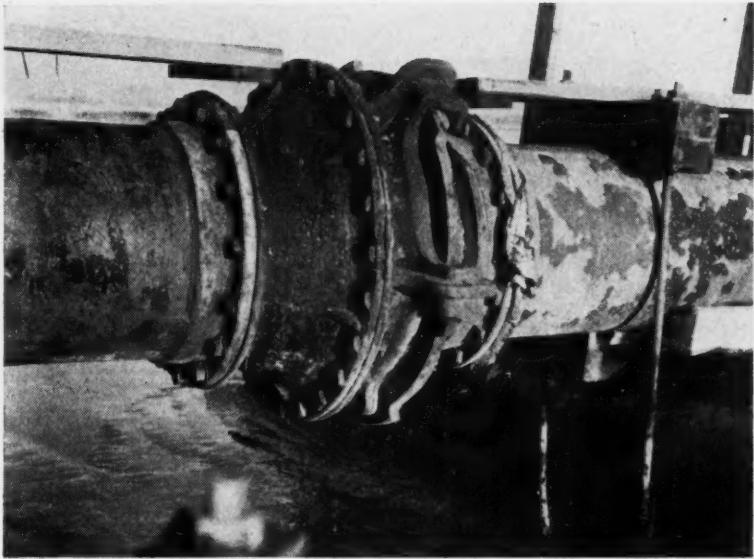


TWO BULK-CEMENT UNITS, for natural and portland cement, and overhead bins for three sizes of aggregates load weighed quantities of dry ingredients into five-batch trucks hauling to two pavers.

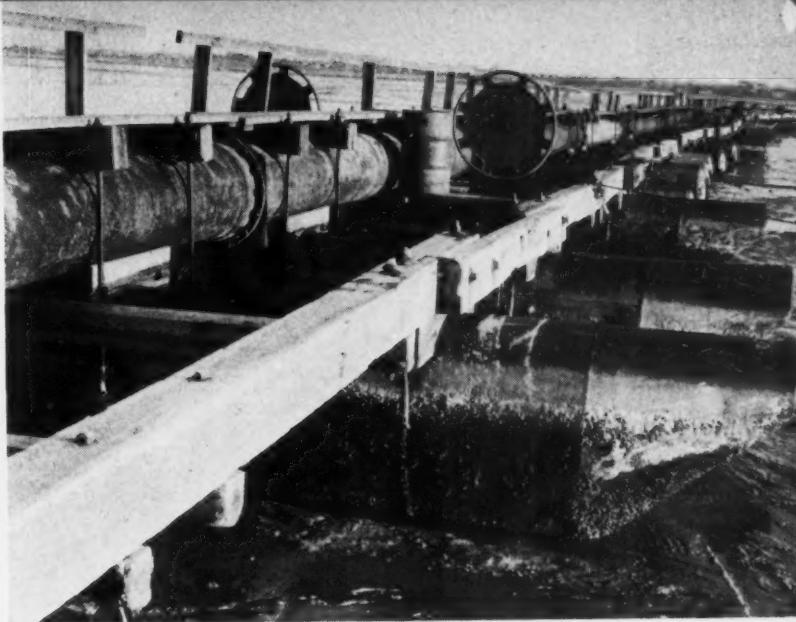
400,000 cu.yd. of cut-to-fill movement within the limits of the runway areas, graded 500 ft. wide. For each section of runway, the working plan showed: (1) the theoretical cross-section measurement of fill required for the area indicated and (2) the length of haul to the fill from the center of mass of the stockpile.

To meet a completion date of June 7, 1945, the Circle Construction Corp., White Plains, N. Y., successful bidder for the contract awarded Aug. 19, 1944, put on the job last fall sufficient equipment to move an average of 250,000 cu.yd. per month. The equipment includes 14 scrapers drawn by two-wheel, pneumatic-tired tractors and 15 scrapers drawn by track-laying tractors. To work with the latter scrapers and in other operations, such as helping to load the all-rubber-tired scraper combinations, the job uses a total of 27 track-laying tractors. Bulldozer attachments are available for 12 of these tractors. For digging drainage ditches the contractor operates three draglines of $\frac{3}{4}$ - to $1\frac{3}{4}$ -yd. size.

Operations are managed in such a way



FLEXIBLE COUPLING in 27-in. pipe allows deflection of floating discharge line. This ball joint is cast from Atlantic, Gulf & Pacific Co. patterns.



27-IN. DISCHARGE LINE carried on copper-alloy pontoons, resting on bottom at low tide, delivers pumped sand to airport fill from dredge "Baltimore." Winches turned by hand wheels take up slack in anchor cables.

as to utilize the scrapers drawn by crawler tractors for hauls ordinarily ranging up to 1,200 ft. and never exceeding 2,000 ft. Longer hauls, falling ordinarily in the 3,000-5,000-ft. range, are reserved for the fast-traveling pneumatic-tired units.

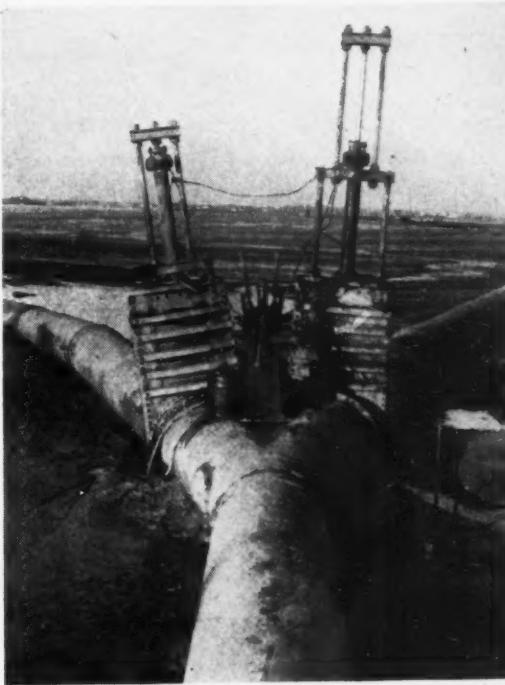
Scooping fine sand with the aid of auxiliary tractors to help in the loading, the tractor-scaper combinations of both classes are able to pick up a heaped load for almost every trip. The pneumatic-tired combinations are all Tournapulls, powered by Cummins diesel engines, eleven Super C's of 15-yd. heaped-load capacity and three Model C's carrying 10 yd. heaped. Traveling on well-maintained haul roads, these units are able to make speeds of about 15 mph. loaded. The 15 scrapers drawn by crawler tractors have the following heaped-load capacities: eight Le Tourneaus, 23-yd.; one LaPlant-Cheote, 33-yd.; one Le-

Tourneau, 15-yd.; three Heils, 12-yd.; and two Gar Wood's, 15-yd. The contractor's fleet of 27 crawler tractors comprises 24 Caterpillar units, 20 D8's, three D7's, and one D6; two Allis-Chalmers HD14's, and one International TD18. Track-laying tractors working at various times with the Tournapulls include four D8's, one D7, one TD18, and one D6 pulling a road drag.

To assist in loading Tournapulls, the contractor uses both the pusher method and the snatch method. Snatch loading, by which the auxiliary tractor pulls in-

(Continued on page 172)

HYDRAULIC VALVES (right), developed by contractor, facilitate opening and closing of branches at Y in discharge line from "Baltimore." Powerful hydraulic control by Watson-Stillman pump eliminates difficulties with stuck valves, frequently encountered when units are manually operated.

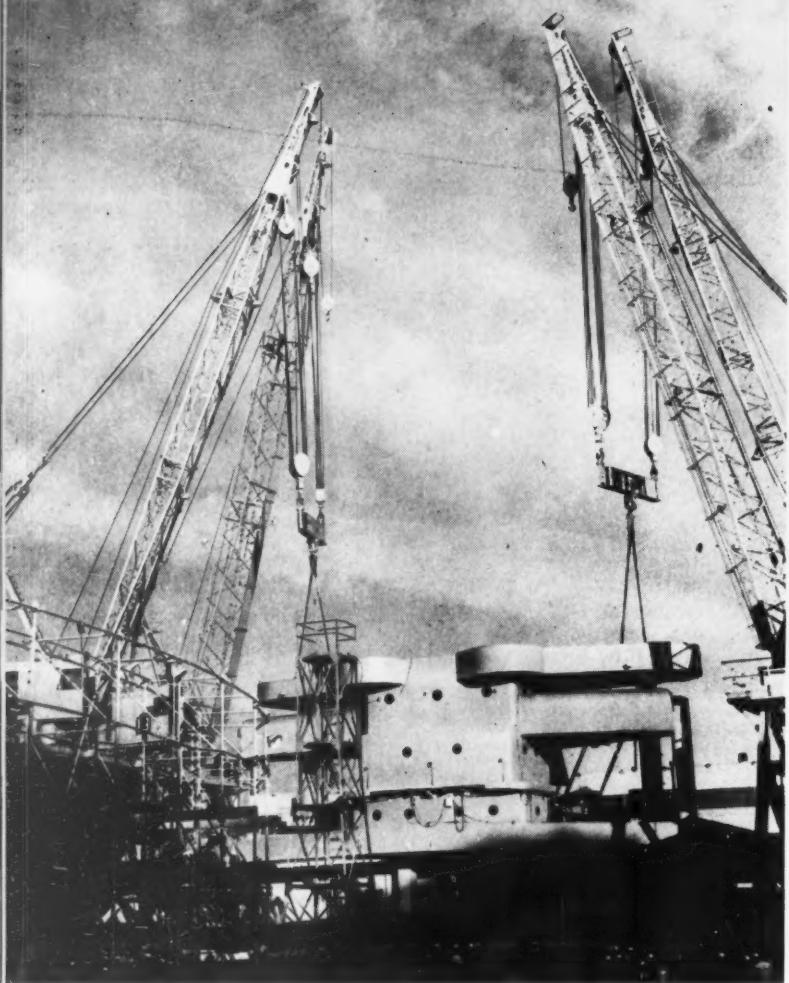


Date	Weather	Working hours	PERSONNEL										EQUIPMENT										Scrapers									
			Superintendents	Assistant superintendents	Chief engineer	Assistant engineer	Maintenance manager	Office manager	Office clerks	Master mechanic	Maintenance men	Scrapers operators	Scrapers operators	Bulldozer operators	Oilers	Total personnel	Bulldozers	Tractors	Tournapulls	Scrapers												
Sun. 29	Clear strong wind	8:00 to 4:30	1												12																	
Mon. 30	Clear	7:00 to 5:30	3	5	1	1	1	2	1	10	2	22	14	8	83	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1		
Tues. 31	Clear	7:00 to 5:30	3	4	1	1	1	1	2	1	10	2	22	15	8	83	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	
Wed. 1	Clear	8:00 to 5:30	3	4	1	1	1	1	2	1	10	2	22	15	8	83	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	
Thurs. 2	Foggy A.M. Clear P.M.	8:00 to 5:30	2	4	1	1	1	1	2	1	10	2	22	14	8	82	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	
Fri. 3	Foggy A.M. Clear P.M.	8:00 to 5:30	2	4	1	1	1	1	2	1	10	1	23	14	8	82	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	
Sat. 4	Foggy	8:00 to 4:30	2	4	1	1	1	1	2	1	10	1	22	15	6	79	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	

Notes: Nov. 1st Grading 8:00 to 5:30 - 6 days; draglines started 40-hour week; 5 maintenance men and 5 oilers worked until 8:00 P.M.

① Worked six hours

CONVENIENT REPORTING FORM utilized by engineers to record personnel and equipment at work on grading contract gives quickly assimilable digest of contractor's activity for each week. Lack of space makes some omissions necessary in this reproduction. Under equipment heading, figures in circles indicate that units worked different number of hours from regular 10-hr. shift.



LIFTING 202 TONS is accomplished by four Clyde whirley cranes at Richmond Shipyard No. 3 of Permanente Metals Corp. Unit made up of upper deck, super deck, captain's bridge and wheel house is carried 500 ft. and set down on hull. Unit weighs 178 tons, with lifting gear making up rest of 202-ton lift. Cranes, two on each craneway, were lashed together in pairs.
Fore 'n' Aft

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BUCKETS ARE HOISTED to working platforms without contact with each other or with structure by means of this steel rack (below), devised by Ferguson Co., of Texas City, Tex., and welded up from scrap angles. Paired lifting eyes, affording hitch for sling at proper balancing point, insure straight lift. Rack is of sufficient width that frame contacts obstructions and protects buckets. Pigtail hooks prevent accidental detaching of buckets.—From CHARLES C. LYNDE.



JEEP FRAMES are straightened by applying pressure to bent portion of frame by means of Blackhawk Porto-Power hydraulic jack. Setup, devised by ORDNANCE SERGEANT JOSEPH FERRARA, cuts straightening time, which was formerly two days, to few hours.

Signal Corps Photo

HOW They Did It

CONSTRUCTION DETAILS

*For
Superintendents and Foremen*



OXYCETYLENE FLAME (below), applied by means of special flame-cleaning tips, is used to remove scale from girder before priming. Flame burns off old paint and heats loose rust and scale, causing it to expand and pop off steel.

Aero News Photo

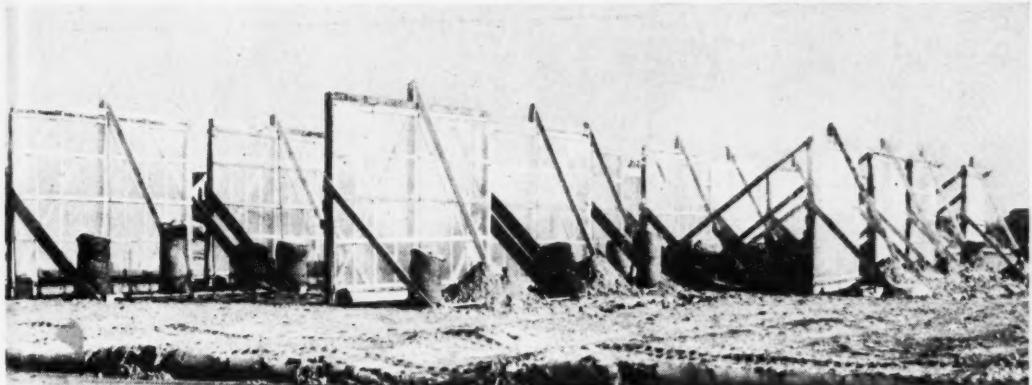


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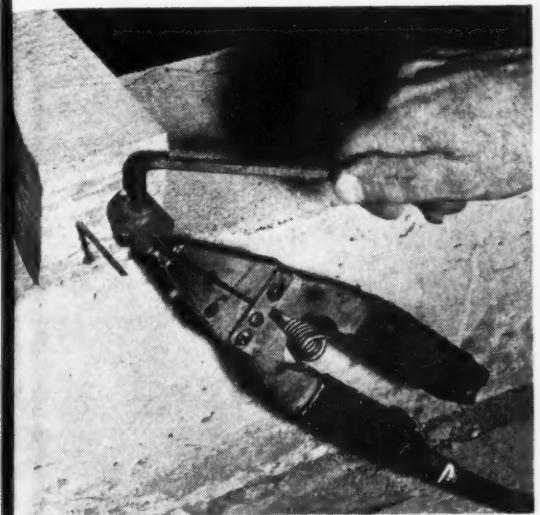
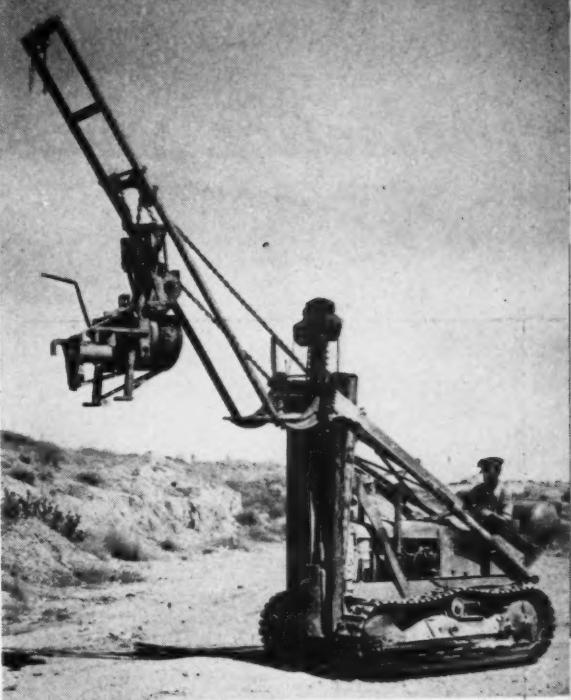
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PORTABLE WINDBREAKS of Glass-O-Net (below), translucent two-ply plastic reinforced with cord mesh, mounted on wood frames, are utilized by A. I. Savin Construction Co., contractor, to keep blown sand off fresh concrete of runways for New York municipal airport at Idlewild, constructed on dredged sand fill alongside Jamaica Bay (described elsewhere in this issue).

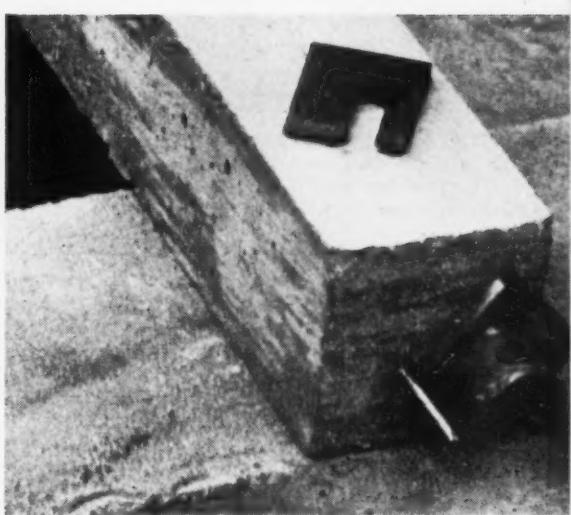


SPECIALLY CONSTRUCTED RIGGING attached to frame structure of Hough cable-operated shovel (right) mounted on Allis-Chalmers tractor converts outfit into crane for heavy pick-up work. Designed by A. F. Drury, New Mexico contractor, crane consists of extended arm of pipe construction.



ELECTRIC PRESTRESSING of reinforcing wires in concrete, simple and effective method both for cast-in-place and precast construction, offers great

possibilities for post-war applications, according to K. P. Billner, president, Vacuum Concrete, Inc., Philadelphia. Advantages obtainable are: (1) Utilizing working stresses in steel of 100,000 to 120,000 psi.; (2) putting entire cross-section area of concrete into compression, as compared with only one-third in conventional reinforced-concrete beams and slabs, making it possible in most members to save about 75 percent of reinforcing steel and 50 percent of concrete; (3) eliminating shrinkage cracks, because concrete is in a permanent state of compression. Wire of $\frac{1}{8}$ to $\frac{1}{2}$ in. dia., with yield point of about 200,000 psi., is coated with special thermoplastic and embedded in concrete with ends protruding. After concrete becomes hard, electric current is passed through wire, which becomes free and expands as heat melts thermoplastic coating. Threaded ends of wires (left) are taken up a predetermined amount and ends are anchored before electric heating is discontinued. Whole operation takes less than 1 min. for each wire. After wire cools (right), thermoplastic coating resolidifies and reestablishes bond between steel and concrete. If small diameter wire is used, anchorages at end are removed as soon as wire cools, in a matter of minutes; for wires of $\frac{1}{4}$ -in. or greater diameter, anchorages remain permanently in place, as bonding area of larger wires is insufficient to prevent slipping. Small-diameter wires generally can be



employed for precast concrete products and slabs between beams. Vacuum Concrete, Inc., recommends $\frac{3}{8}$ to $\frac{1}{2}$ -in. dia. wires for beams and girders.

LARGE TENT (below) covers entire basement of housing project in Milwaukee, Wis., to permit laying of concrete block foundations during severe cold wave. Salamanders raised temperature inside tent 40 to 50 deg. over that outside. Mortar mixing (right) is done in open with Rex tilting mixer and mortar and other materials are brought into tent through trench. Contractor is W. C. Doering.

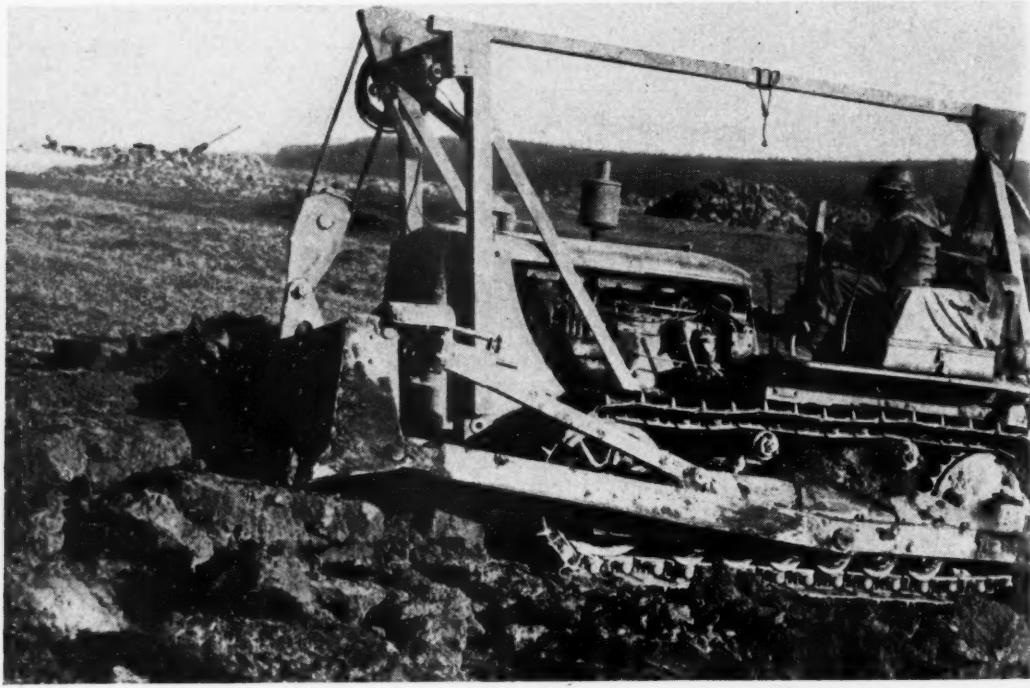


Protective Dugout Built for Plane at French Airfield

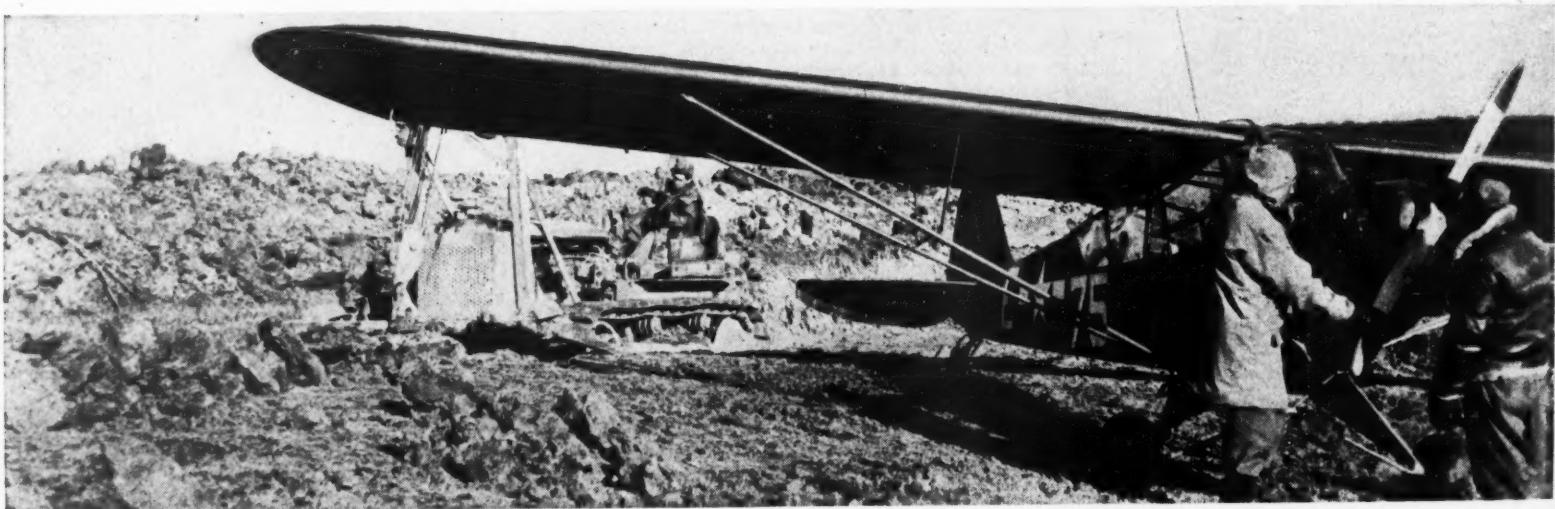
Signal Corps Photos



EXPLOSIVES to blast hole in frozen topsoil, preparatory to excavation by bulldozer, are prepared by U. S. Army Engineer equipped with caps, T.N.T., pliers, time fuse wire, knife and matches.



BULLDOZER digs out pit for artillery liaison plane after T.N.T. charge blasts hole to enable bulldozer blade to dig in.



DUGOUT is completed by bulldozer as pilot prepares to put plane into pit.



ARTILLERY LIAISON PLANE is placed in dugout somewhere in France. Pit is built to plane's proportions so it will fit tightly and escape damage from fragments of bomb that might strike in its vicinity.

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FOAM PLASTIC BALL (left), made with weight as low as 2 lb. per cubic foot, is lighter than rock wool, glass wool, or cork, and also lower in heat conductivity. Its use in thermal installation is predicted after war.

General Electric Photo

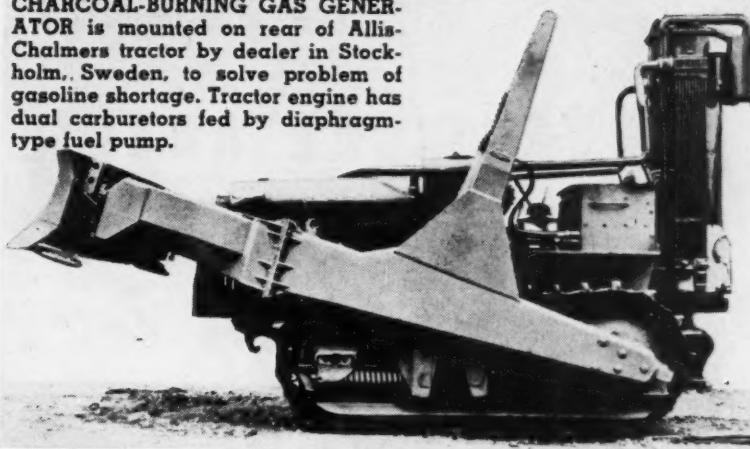


EAST MEETS WEST in China, as oxen wagon (right) rolls past newly constructed runway with modern plane coming in for landing.

European Photo

Job oddities

CHARCOAL-BURNING GAS GENERATOR is mounted on rear of Allis-Chalmers tractor by dealer in Stockholm, Sweden, to solve problem of gasoline shortage. Tractor engine has dual carburetors fed by diaphragm-type fuel pump.



DUMMY JAP CRUISER, 650 ft. long, is used by U. S. Army Air Force pilots and bombardiers for practice at Muroc Dry Lake, Calif. Built of timber and chicken wire, it is used for identification, strafing, skip bombing and high altitude bombing with sand bags as bombs. Sand revetments are targets during strafing attacks.

Press Association Photo

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FAST FRUIT EXPRESS will operate from this airport (below), known as Ross Field, privately financed by business men of twin cities of St. Joseph and Benton Harbor, Mich., at cost of about \$250,000 to provide quick outlet for big fruit and vegetable market. With scraper fleet drawn by Caterpillar diesel tractors, Carl Goodwin & Sons, subcontractor, Allegan, Mich., moves 150,000 yd. of sand in grading field for John J. Yerington, Benton Harbor, who holds contract both for grading and for paving four runways totaling 13,800 ft. long by 100 ft. wide.



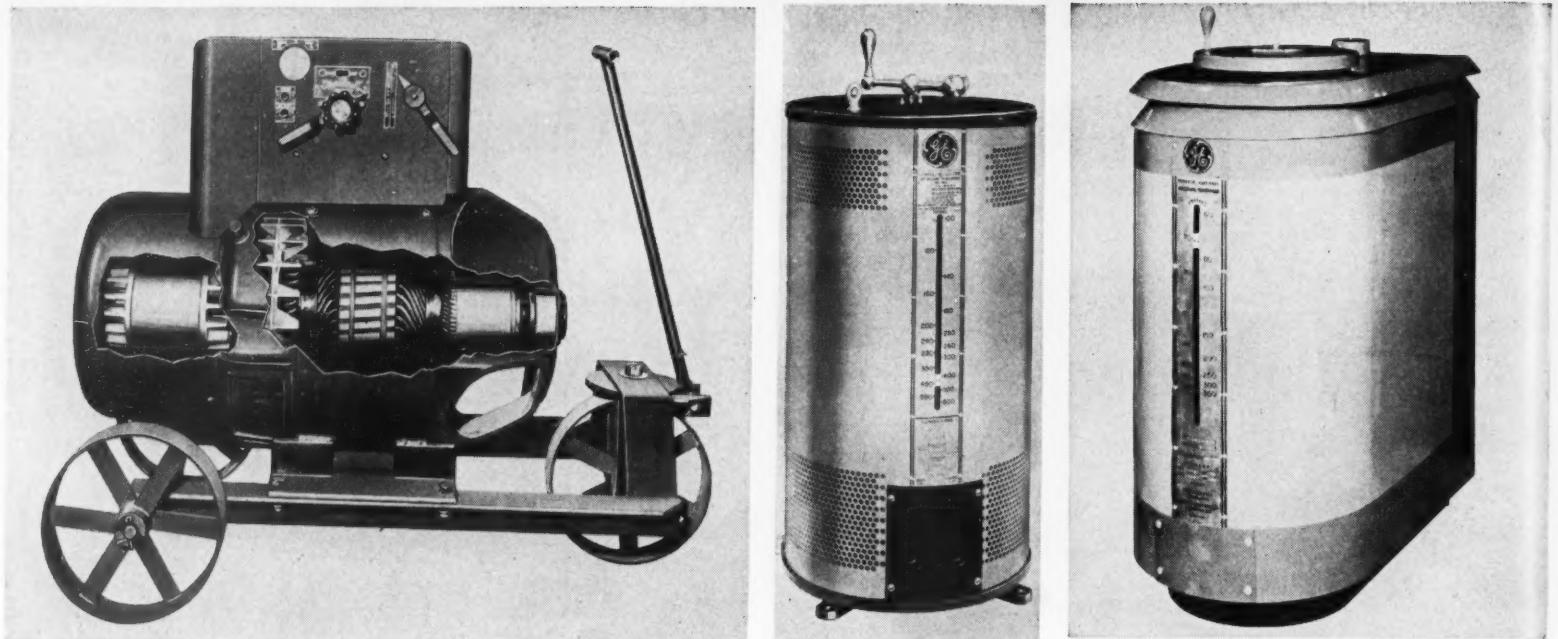


Fig. 1 . . . THREE COMMON TYPES of arc-welder: (a) left, single-operator, dc. portable motor-generator unit; (b) center, arc welding transformer of indoor ac. type; (c) right, outdoor type of ac. welding transformer.

PRACTICAL ADVICE ON HOW TO INSURE

Safety in Arc Welding

ARC WELDING is the only widely practiced industrial occupation in which the operator handles a live electric circuit all day. Yet, in spite of all the implications of that fact, the danger of electric shock to the operator is not so great as is often supposed. While no figures on the total employment of arc welding operators are available, a conservative estimate based on industry sales of arc-welding equipment and on the consumption of electrodes gives a figure well over 200,000 for the year 1943. So far, we have heard of only 4 electrocutions among

By R. F. WYER

Application Engineer, Electric Welding Division,
General Electric Co.

arc welding operators during the entire year 1943.

The shock hazards which do exist might be classified as to their relationship to equipment and its layout, maintenance, supervision, and operator education.

The welding units with which we are

mainly concerned, as illustrated herewith, include a single-operator, dc. motor-generator arc welder (Fig. 1a) and ac. arc-welding transformers of two types, one (Fig. 1b) for indoor and the other (Fig. 1c) for outdoor service. On the motor-generator welder the motor usually operates on 220-, 440- or occasionally 550-v., two-phase, ac. The generator delivers from 50 to 100 v., dc. Insulation around the windings of the motor, and additional insulation on the generator, effectively separates the power-circuit voltage and the welding circuit.

The indoor type of ac. welder (Fig. 1b) transforms energy from the power system into lower voltage and higher current, with control of the current output to suit it to the welding process. This equipment also insulates the power circuit from the welding circuit. The input, or power circuit winding, is electrically separate from the 75-v. welding circuit winding.

The ac. welder designed particularly for outdoor service (Fig. 1c) includes a welding transformer like the indoor type, together with a built-in control panel which automatically reduces the voltage on the welding circuit to about 30 v. within 1/15 sec. after the welding arc is extinguished, as when the electrode must be changed. Touching the electrode to



Fig. 2 . . . LONGEST ALL-WELDED CRANE GIRDERS ever built are these 120-ft. units for 15-ton mill-type crane fabricated with aid of General Electric alternating current arc welders.

the work automatically puts full power on the welding circuit again.

With respect to the installation of arc-welding equipment, the major safety point is the necessity of grounding the frame of the welding set, regardless of whether it is an ac. or dc. unit, or whether it is stationary or portable. Common sense, as well as the National Electrical Code, demand that this should be done. An ungrounded unit, even one in perfect condition, can give annoying shocks and tickles to a grounded individual, because of the inherent ability of an electrical circuit to induce a static charge on another conductor separated from it by insulation. The effect is the same as that in a condenser, or Leyden jar.

In the event of failure of the insulation, due to age, abuse, or accident, the frame of a unit may become charged to full power circuit voltage, with serious consequences, unless the frame is ground-

welding electrode is short-circuited on the work.

On the welding-circuit side of a unit, care should be taken to avoid the possibility of getting double the normal circuit voltage between two adjacent welding circuits, because of the connection of one unit with one polarity, and the other with opposite polarity. On ac. units, abnormal voltage of somewhat lower value may also be obtained if adjacent welders are operated from different phases of the supply line. This factor has rarely, if ever, caused serious trouble because of the small likelihood that an operator will get hold of two welding circuits at once.

Insulate Electrode Holders

Probably the most important item in equipment, from the safety point of view, is the electrode holder. Although uninsulated holders have been used in arc

will put him in danger. The worst feature of this holder is that the head, projecting out beyond the ring or collar of insulating material just above the hand, is entirely uninsulated. Each time the operator changes welding electrodes, there is a good chance that he will contact this exposed metal. If he should fall on the holder, or sling the cable over his shoulder or around his neck, as is frequently done, this live conductor may contact his chest or back.

There are now several types of good insulated electrode holders on the market. They should be used on any welding job, and their insulation should be kept in first-class condition. Studies of accident reports reveal, in a good percentage of cases, evidence that uninsulated electrode holders caused or contributed to death.

Maintenance and supervision play an important part in the safety side of weld-



Fig. 3 . . . POTENTIAL TROUBLE is suggested by this welding setup. Operator is using uninsulated electrode holder in cramped space, with his body in contact with conducting metal.



Fig. 4 . . . DANGEROUS WELDING PRACTICE allows cables to be coiled carelessly under legs of operator who may trip when he arises. Also, electrode holder is not insulated.



Fig. 5 . . . BROKEN INSULATION on electrode holder invites trouble.

ed. If the proper ground connection is in place, however, the frame cannot have a voltage to ground, and the only effect of such a failure will be the blowing of fuses or tripping of circuit breakers and disconnection of the unit from the line.

This immediately suggests the necessity of installing adequate overcurrent protection and switches in the power circuit to the welder. Fuses or circuit breakers must be capable of interrupting the maximum current which may be drawn by a short circuit in the motor or power leads of a dc. welder, or in the primary circuit of an ac. welder. Disconnecting switches must be capable of interrupting the stalled rotor current of the dc. machine, or the maximum current which can be drawn by the ac. unit when the

welding for many years, good practice unquestionably requires that fully insulated holders should be used.

An uninsulated electrode holder, and an ideal setup for potential trouble, is illustrated in Fig. 3. The operator is in a cramped space, and also undoubtedly in contact with the conducting metal in a number of places on his body, unless his clothing is dry and his shoes free from nails. In his hand he holds an electrode holder which has a handle of insulating material, but through which extends an uninsulated screw-head. Probably any contact he might make with the screw, through wet gloves or with the bare hand, would be too small in area to permit electrocution. But a shock may make him do something involuntarily, which

ing, as is the case in almost any other process. Fire hazards should obviously be watched for and, when found, eliminated. Welding cables and their connectors should be examined frequently for breaks in insulation. The extremely hard service to which welding cables are subjected often result in severe damage to the insulation. Yet the welding operator, accustomed to arcs and sparks in his daily work, often disregards accidental short circuits which spell trouble to the safety man or the fire inspector. Likewise, welding return circuit connections should be given attention, by supervision. Arcs or flashes in unexpected places along the return path of the welding current may result in fire hazards if rein-

(Continued on page 154)

Steel Cargo Ships

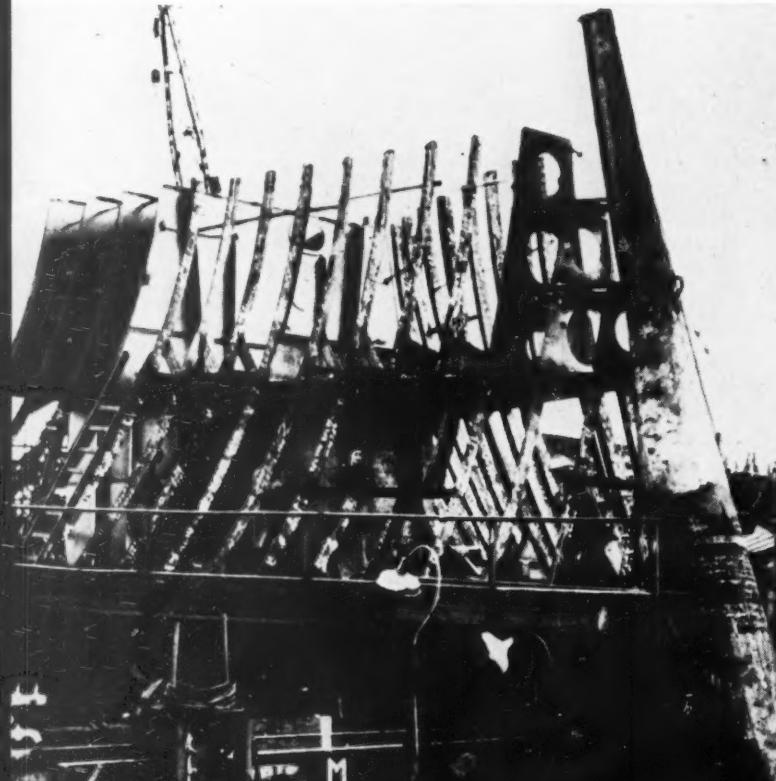


How Fore and Aft Peaks of C-1 Hull Are Assembled in Sections

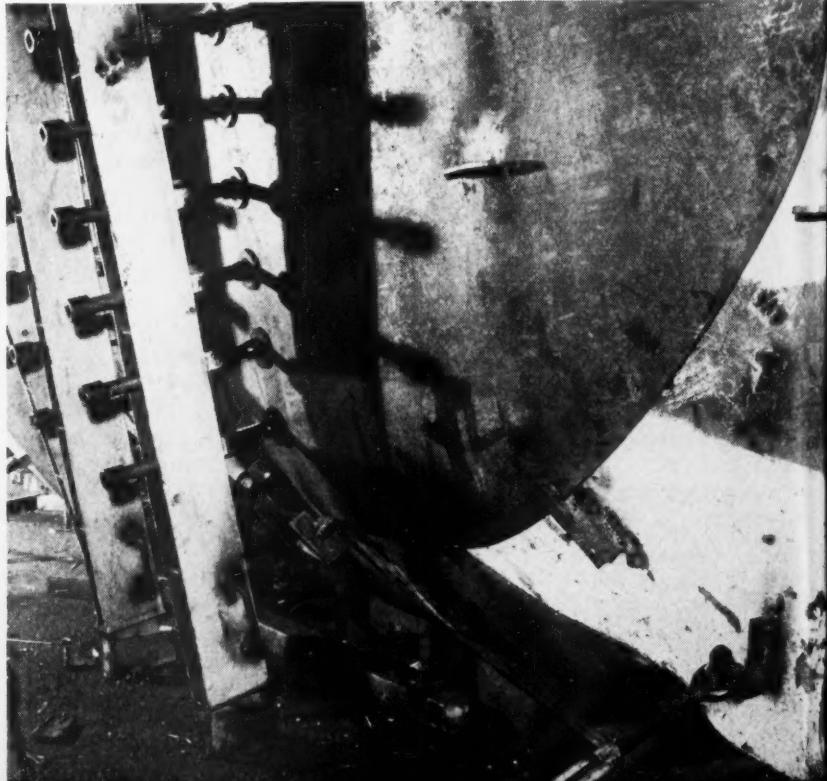
Part 2 of article continued from November, 1944 issue

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1 UPPER FOREPEAK (below) is assembled upside down with main deck resting on skids. Inclosed section inside assembly is storage space. This portion also includes chain locker and windlass room.



2 SHELL PLATING (below) is fitted and welded on lower portion of forepeak while on skids. Hook at bottom of stem is "paravane skeg" to which paravane gear is attached to deflect mines and cut them adrift.



THE C-1 CARGO AND PASSENGER SHIP is one of seven different types of vessel which the Consolidated Steel Corp., Ltd., is constructing for the Navy and the U. S. Maritime Commission. Built at the company's Wilmington, Calif., shipyard, the C-1 hull is 517 ft. 9 in. long, beam width is 60 ft. and gross deadweight tonnage totals 9,125 tons.

Initial steps in its construction, which begins with prefabrication of complete ship sections at an inland plant, were described in the November, 1944 issue of CONSTRUCTION METHODS.

Among the various units which are assembled on skids before installation on the hull is the forepeak assembly which forms the bow of the ship. It is constructed as two units—the lower forepeak tank assembly and the upper forepeak assembly. The lower portion extends from the stern casting to the end bulkhead and from the keel to the upper deck. The afterpeak assembly is composed of three parts. Accompanying photographs show how these sections are built and installed. A third and final article in this series, which will appear in an early issue, will illustrate final stages of construction and launching.



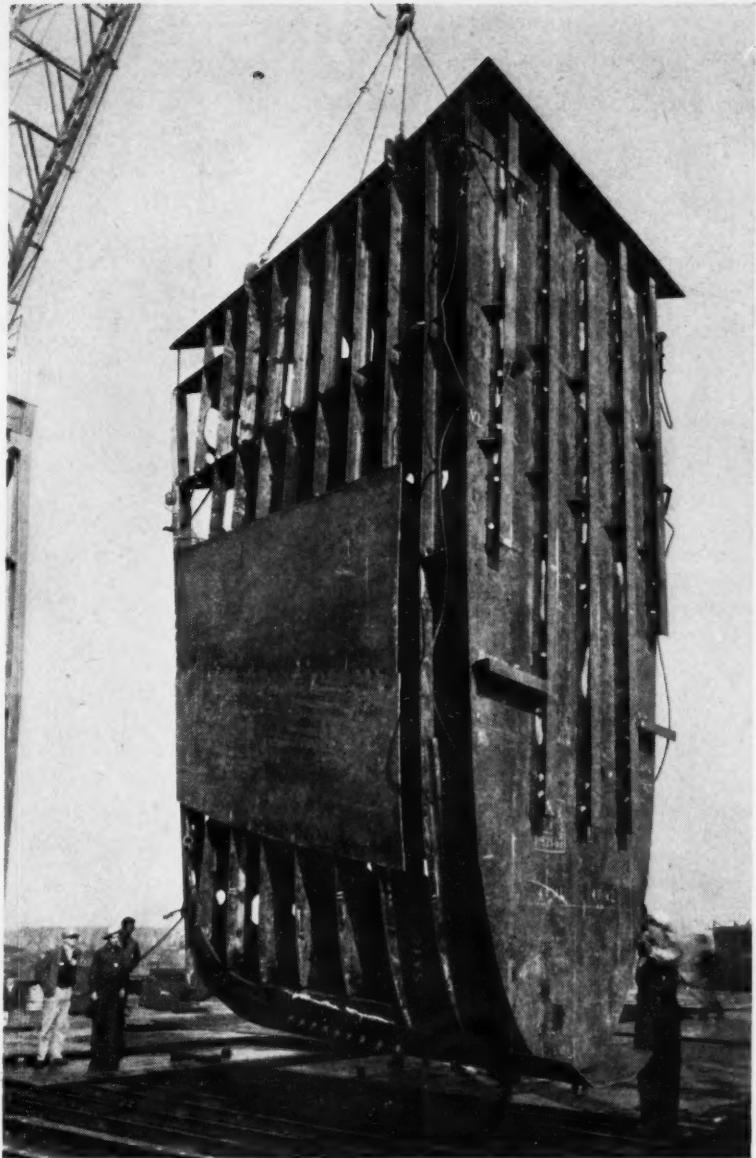
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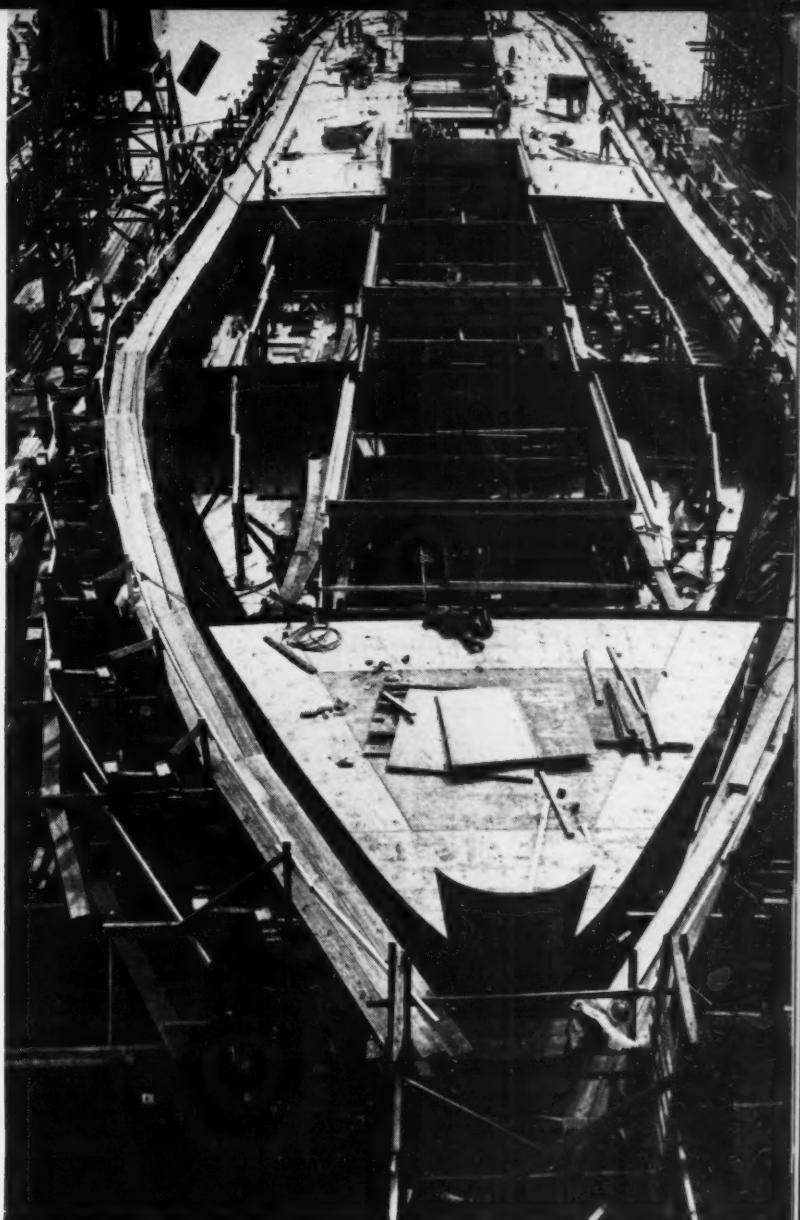
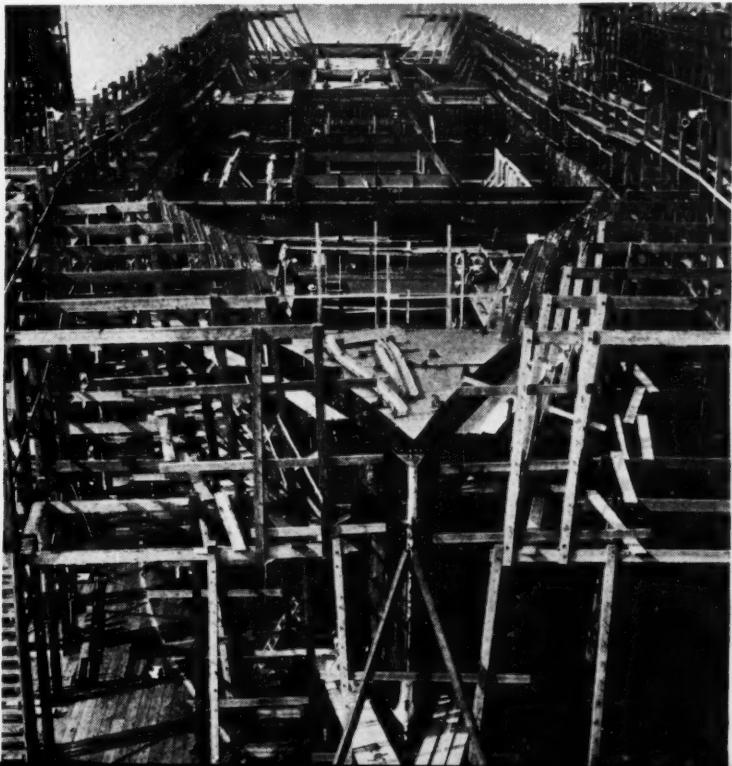
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3 FOREPEAK TANK ASSEMBLY is ready to be hoisted into position. Ship's keel extends aft from bolted section at bottom.

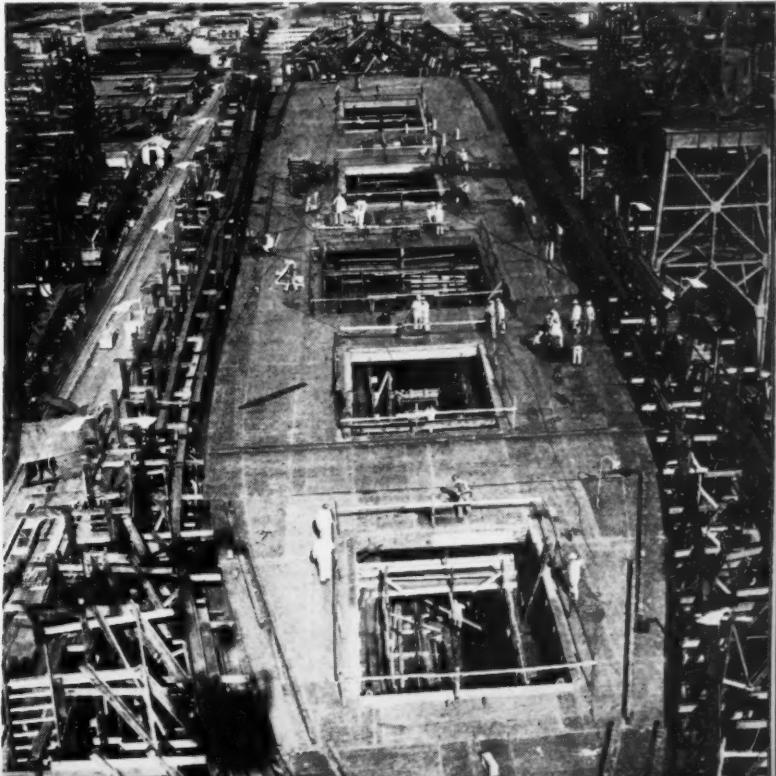
4 GIRDERS (below), longitudinal and transverse, form hatch beam arrangement, with lower forepeak tank assembly in position on hull. Frames for shellplating extend upward aft of lower portion of forepeak. End bulkhead, known as collision bulkhead is compulsory structural member on all seagoing vessels. Purpose is, in case of collision, to confine damage to forepeak and prevent water from shipping into cargo space.



5 DECK TWO rests on transverse landings or shelf-plating provided on bulkheads. Six major bulkheads rise vertically to this deck and are then extended to main deck above. Other transverse and longitudinal bulkheads divide decks into other compartments and holds.

Continued on next page ➤

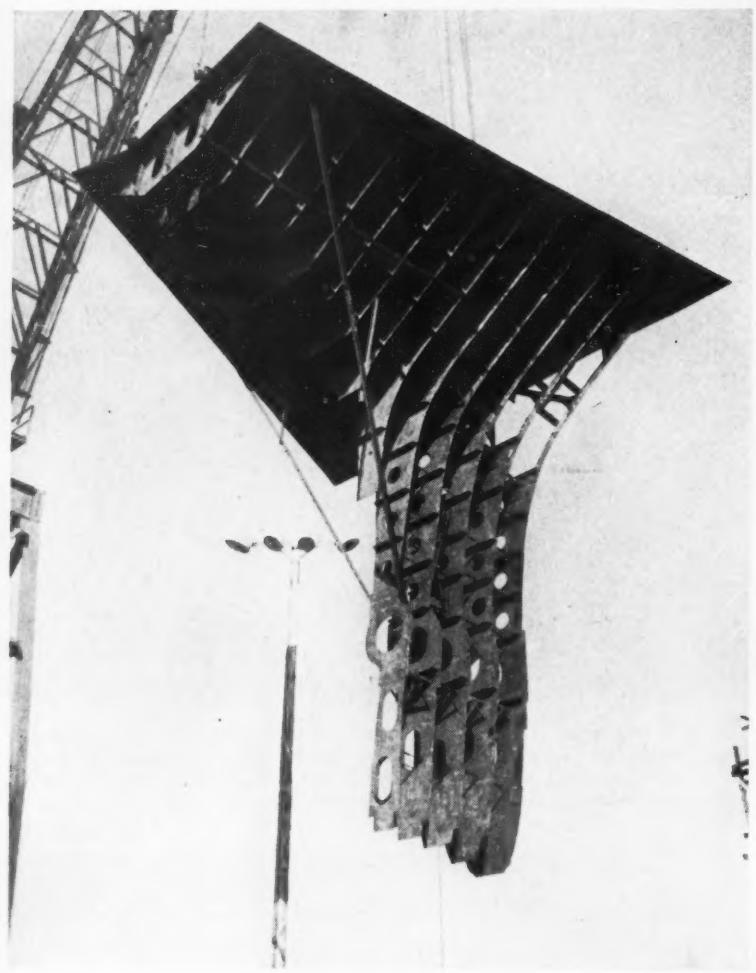
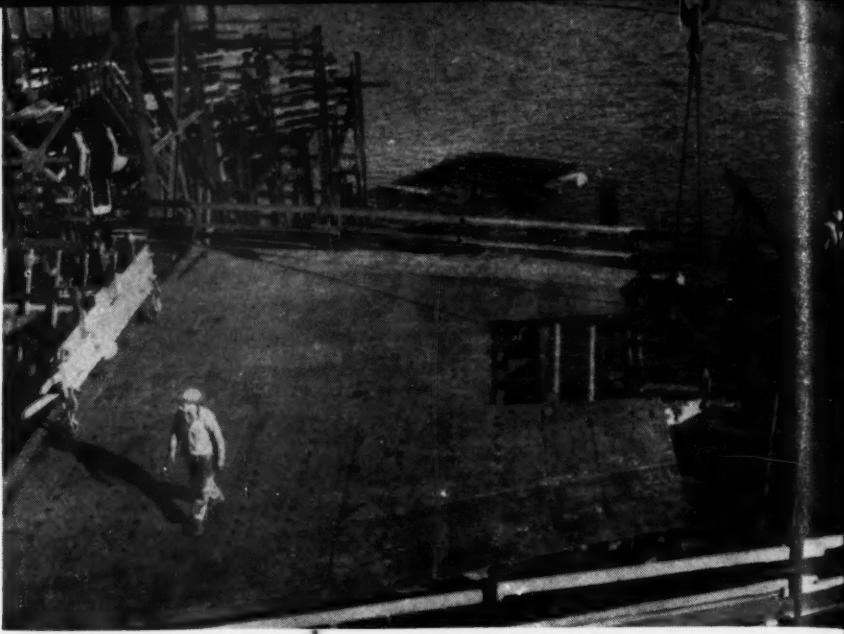
6 OPENINGS IN DECK (below) are cargo hatches which facilitate loading and unloading. There are three holds forward of engine room and two aft.





7 WOMAN BURNER (left) runs bevel on plating to be used for decking. Radiograph is electrically operated and can be regulated for precision burning.

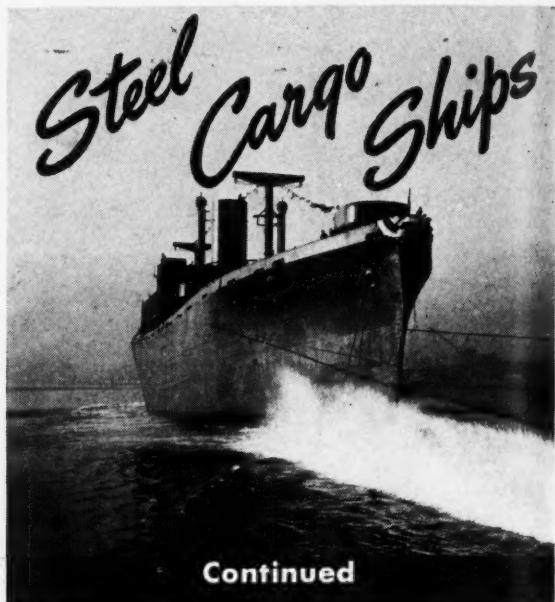
8 LOWER PORTION of afterpeak assembly (below) is conveyed to hull. Flat top is portion of deck two or steering flat. Note larger holes through supporting bulkheads. They will be aligned and reborred for propeller shaft tube.



10 UPPER PORTION is lowered into position. Top of this portion is main decking.



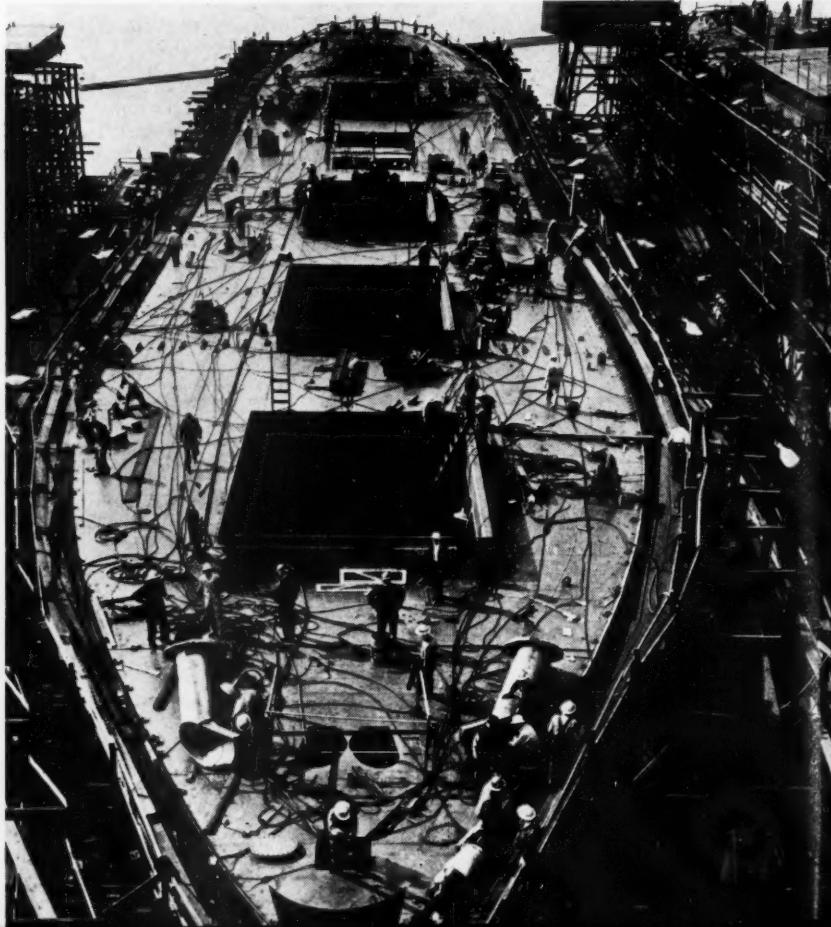
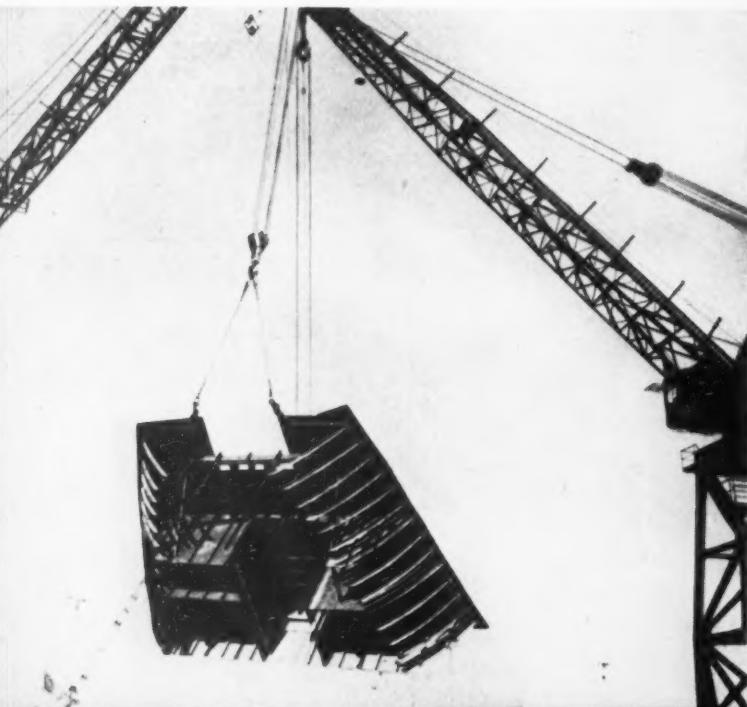
11 MAIN DECKING (below), cargo holds and engine room hold are complete. Note, in foreground, hawse pipe holes with port and starboard hawse pipes laying to respective sides.



Continued

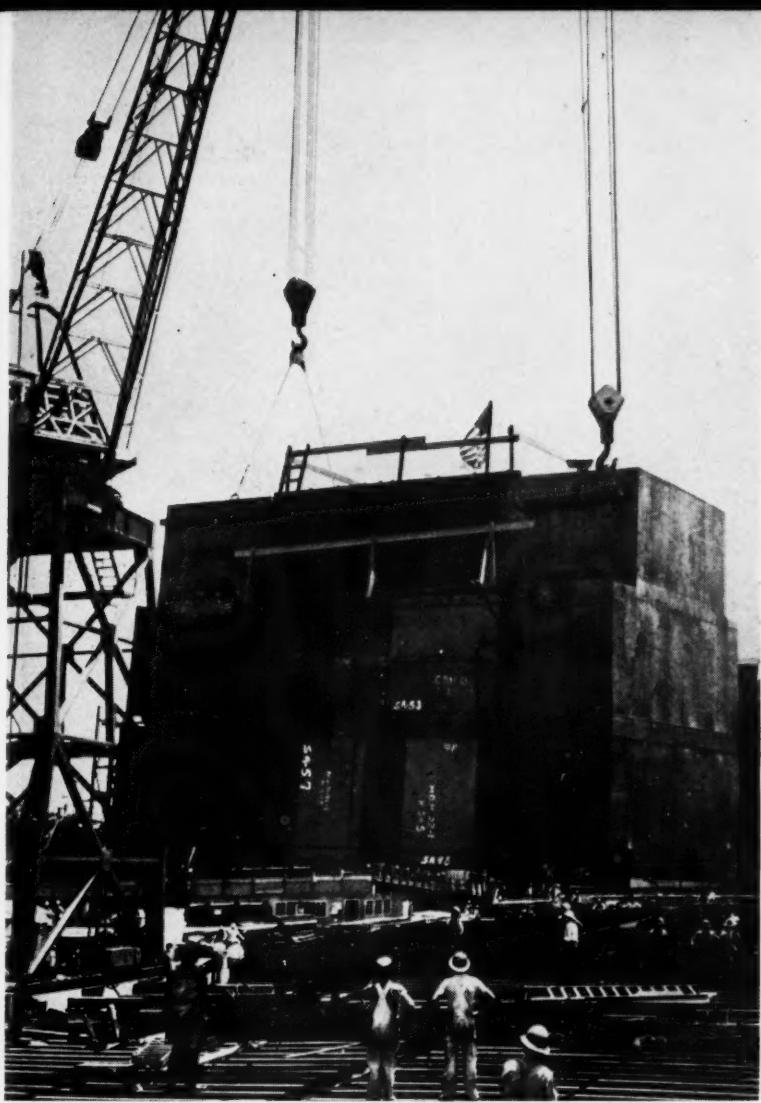
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9 INCLOSED SECTIONS within upper afterpeak assembly will house paint shop, lamp room, and carpenter shop.



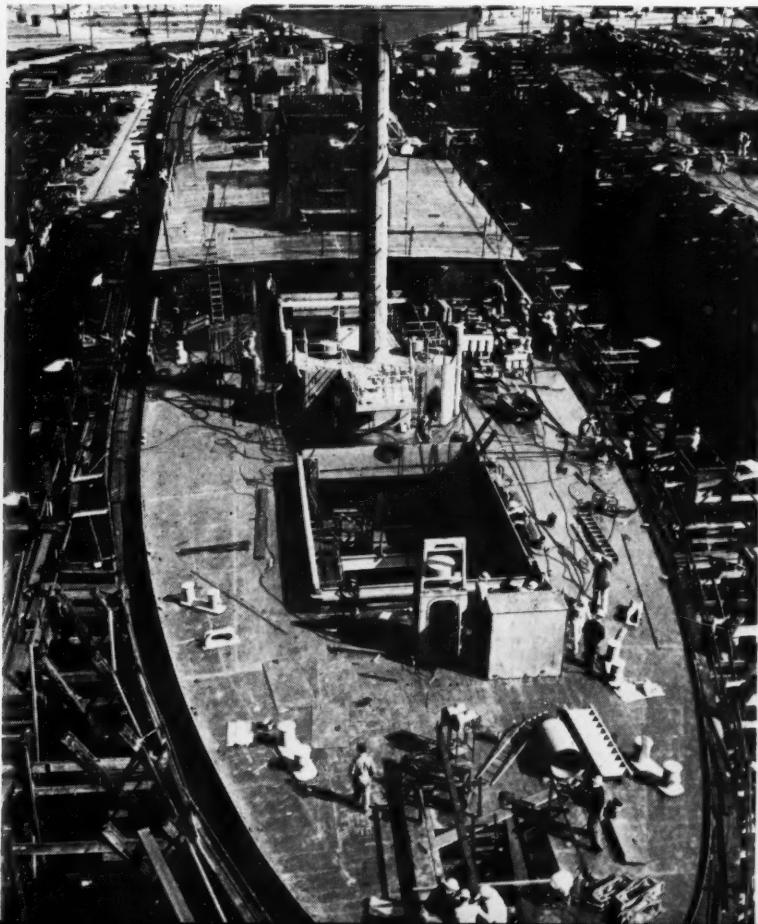
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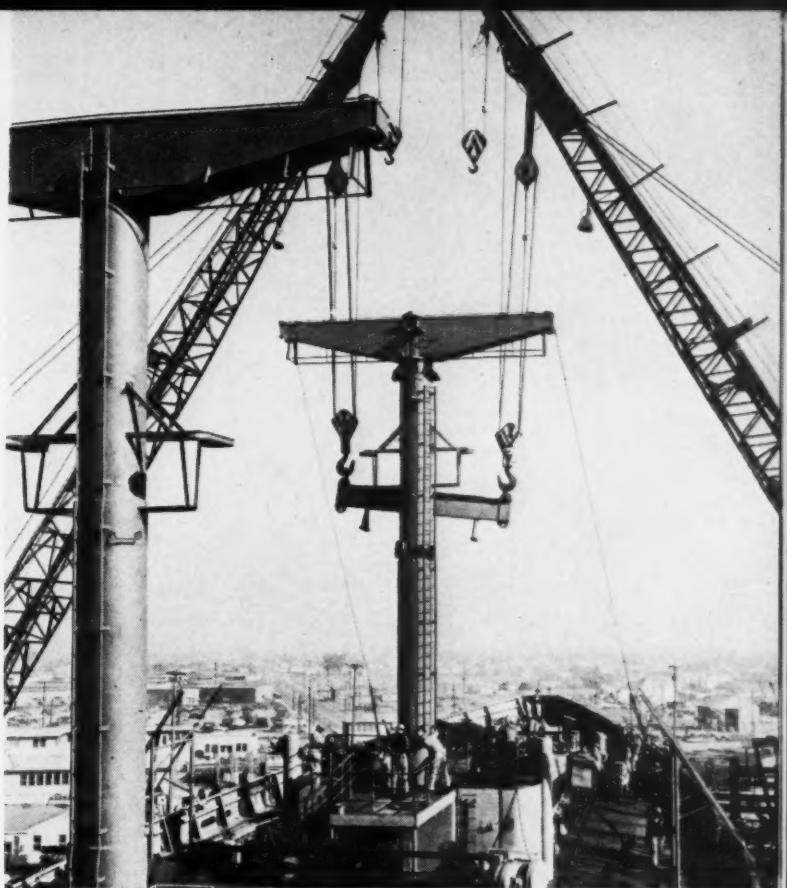


12 SUPERSTRUCTURE SECTION, including engine and boiler room casings, is conveyed by cranes from point of fabrication to hull to be placed over engine room hold. Weight of unit is about 42 tons.

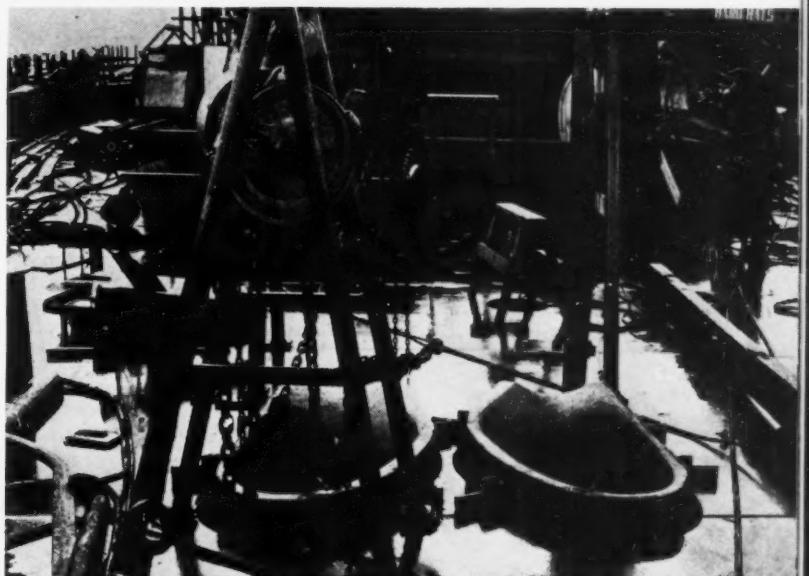
13 CABIN DECK of superstructure (below) extends almost completely across hull, with narrow companionway allowed on both sides for passage fore and aft.



15 STARBOARD HAWSE PIPES (right) are pulled into position. Port hawse pipe is blocked up ready to secure by welding.



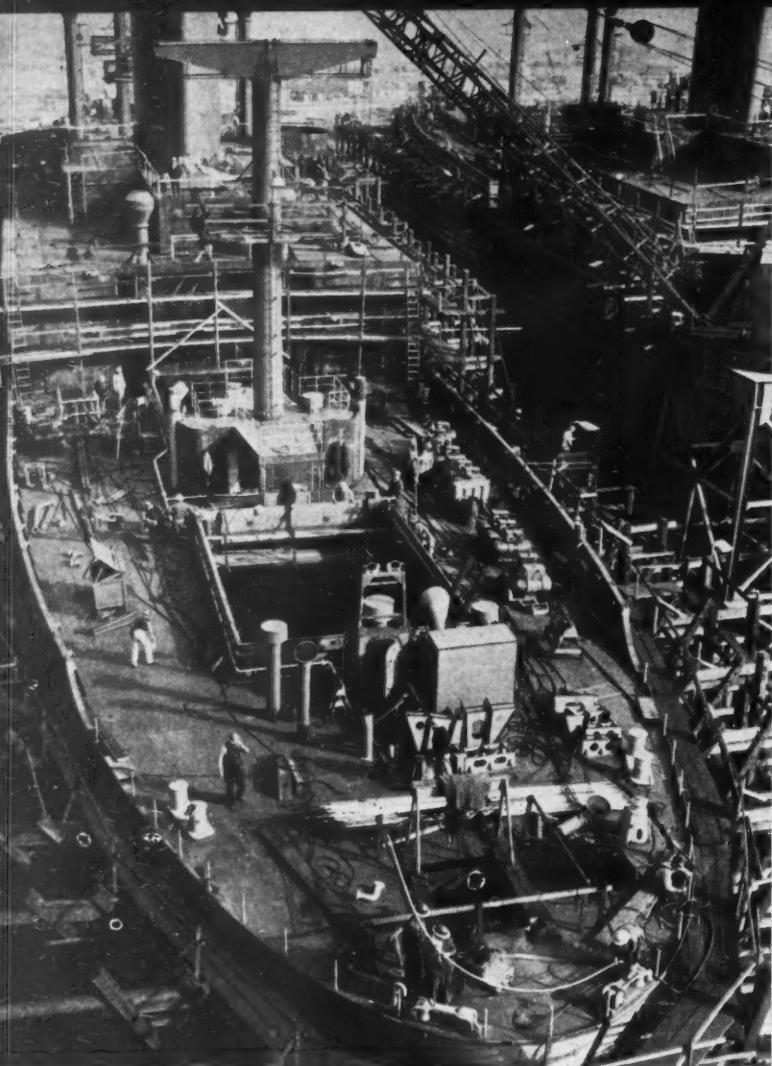
14 MAST is run through resistor house to rest on deck No. 2. Resistor houses contain electrical controlling devices necessary for safe operation and prevention of overload of cargo winches. These cargo winches are set outside of resistor houses and cargo booms are rigged to masts.



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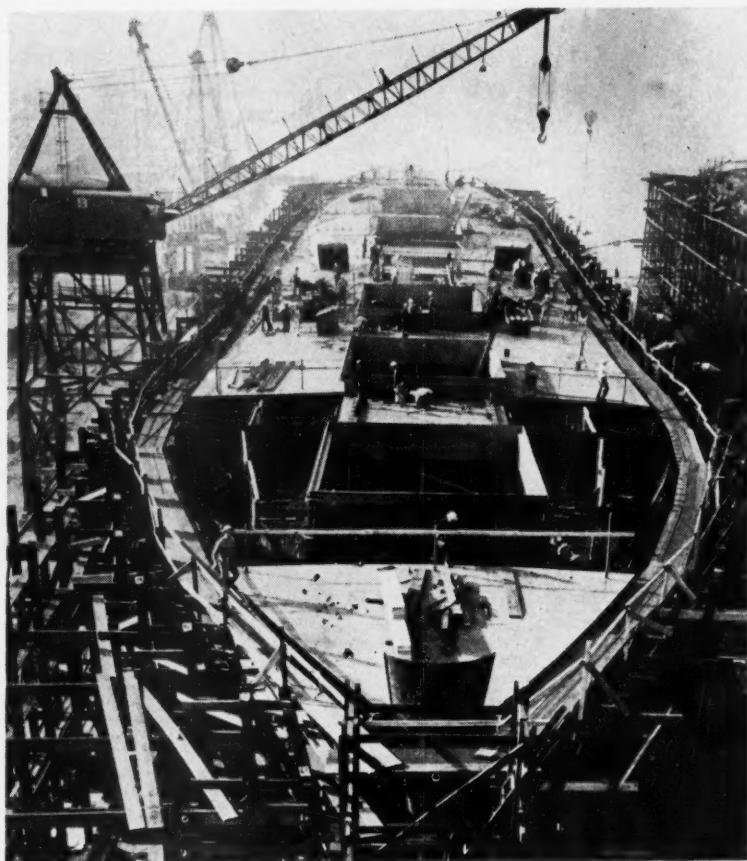
16 HAWSE PIPE is welded to inboard side of hull (right). As many as 14 passes are required to complete this difficult weld.





17 FROM AFTER END can be seen wheel house and casing top, as well as after portion of nearly completed bridge deck. Smokestack is secured into position. Hatch in side affords access to stack. Pipes with funnel shaped heads and air scoops extending above decks are ventilation exhausts and intakes.

Steel Cargo Ships...Continued



18 CONSTRUCTION ABOVE DECK nears completion, with forward masts in place and much of superstructure built. On section forward of cargo hold can be seen anchor chain pipes waiting for installation. These pipes act as leads for anchor chain from main deck to chain locker. Anchor windlass will be placed directly aft of hawse pipe outlets.

Additional operations in the construction of a C-1 cargo and passenger vessel will be pictured in an early issue.

Japanese Army Engineers Appraised by War Department

THE OFFICE OF WAR INFORMATION has recently released a report on the Japanese soldier — his characteristics, training, weapons, and equipment—based on material made available by the War Department and other official sources. The Japanese Army, as of Dec. 1, 1944, numbers at least 4,000,000 men, of whom 2,000,000 are in China. The Japanese are nowhere near the bottom of the barrel in fighting reserves. Even today, the War Department says, they can equip and train 2,000,000 more soldiers without seriously affecting war-production manpower reserves. This figure does not include the added millions who might be "recruited" from subject nations. The U. S. Army now numbers 8,000,000, of whom 4,000,000 are overseas. After "Victory in Europe" Day it is not believed

that more than 3,000,000 U. S. soldiers will have to be used in the Orient.

The average Japanese soldier is 5 ft. 3 in. tall, weighs 117½ lb. He can lift 150 lb. with his feet together, bringing the weight to knees, to shoulder and then to his back. The average U. S. soldier is about 5 ft. 8 in. tall, weighs 145 lb. Americans generally credit the Japanese soldier with being a good fighting man. The Army endorses that viewpoint. The belief that the Japanese soldier is a stupid, insensate peasant, is, according to the War Department, completely erroneous.

Japanese soldiers, in peacetime as in wartime, are selected at the age of 8 and if, at that time, they are physically and mentally fit, their military training begins at once as part of their regular edu-

cation. Educationally, the background of the typical Japanese professional soldier is as high as that of the typical American fighting man. The regular, professional Japanese soldier has had the equivalent of two years of high school education. Between 20 and 25 per cent of all Japanese soldiers speak English "efficiently."

The portion of the report dealing with Japanese Army Engineers is reproduced below:

Japanese Engineers are well equipped and are armed as infantry. They have shown outstanding ability in both the construction and demolition of bridges. On the other hand, airfields and roads so far encountered have not been up to Allied standards in speed of construction

(Continued on page 160)



BAILEY BRIDGE is cantilevered across river at La Lima, Italy, to meet hastily built abutment on opposite bank.

140-Ft. Span OF BAILEY BRIDGE CANTILEVERED TO PLACE IN ITALY

Signal Corps Photos

ALONG WITH THE BULLDOZER, jeep, 2½-ton truck and pierced plank landing mat, the Bailey bridge is one of the outstanding developments of this war. In the accompanying views a Bailey bridge of 140-ft. span at La Lima, Italy, is shown being cantilevered out to meet the hastily built abutment on the opposite bank. This type of construction was one of the major factors in the speedy advance of our troops through France, and in the reestablishing of lines of supply.

The steel span is not resting on the two cables which pass diagonally under the span, as might be interpreted from these views, but is cantilevered and telescoped out, and pulled by cable to the opposite shore. Multiple sections of Bailey bridge sometimes double- or even triple-deck are capable of carrying the heaviest of highway and railway loads.

CABLES PULL 140-ft. steel span (right) to opposite shore. Bridge is not resting on cables seen beneath it, but was cantilevered and telescoped out.





CHARLES M. UPHAM, engineer-director, A.R.B.A., chats with MAJOR GENERAL PHILIP B. FLEMING, administrator, Federal Works Agency, who spoke on "The Status of Public Works Planning."



CHARLES W. SMITH, of the Smith Engineering & Construction Co., of Pensacola, Fla., is president of the A.R.B.A. Contractors' Division.

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MAJOR GENERAL EUGENE REYBOLD (right), Chief of Engineers, U. S. Army, told the convention of the work of the Engineers in war theaters.



PAUL B. COCHRAN (left), general manager, Buckeye Traction Ditcher Co., Findlay, Ohio, is the newly elected president of the Manufacturers' Division.



NATHAN L. SMITH (right), chief engineer, Department of Public Works, Baltimore, Md., is new president of Municipal Division.



ARTHUR F. RANNEY (left), Summit County engineer, Akron, Ohio, is new president of County Highway Officials Division.



E. R. GALVIN, president, Tyson Bearing Co., Massillon, Ohio, completed his term as president of the Manufacturers' Division, A.R.B.A.



CONGRESSMAN JENNINGS RANDOLPH, of West Virginia, is greeted by JAMES J. SKELLY, contractor, of Media, Pa., and newly elected A.R.B.A. president.

Qualities AS PHOTOGRAPHED AT THE ANNUAL CONVENTION * STEVENS HOTEL * CHICAGO * JAN. 16-19, 1945



H. F. CLEMMER (left), engineer of materials, District of Columbia, was selected to head up the work of the A.R.B.A.'s technical committees.



CAPTAIN H. W. JOHNSON (right), U. S. Navy, told the convention of the operations of the Seabees in Pacific war theaters.



W. A. PENICK (left), of Asphalt Paving Service, Inc., Richmond, Va., is serving as president of the Virginia Road Builders Association.



NELLO F. TEER, Jr. (right), contractor, of Durham, N. C., is president of the Carolinas Road Builders, most recent affiliate of the A.R.B.A.



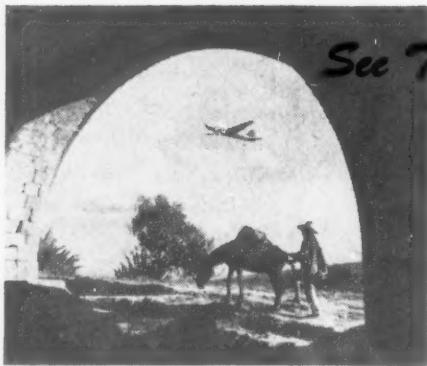
SOUTHWARD HO!

Soon it will be Southward Ho...into the lands of ancient men...to the "last frontiers of the Western Hemisphere." The Pan American Highway System will open the way to new, unexplored, unknown riches...commercial trade...exchange of tourists, culture and knowledge.

A dream in 1924...it is expected to be opened for all weather travel late in 1947. Only gaps remain to be completed. Beginning at Nuevo Laredo, Mexico, it links the capitals of 17 Latin American countries — as far south as Buenos Aires, Argentina, thence north to Rio de Janeiro, Brazil.

Constructing this link to American solidarity is one of the toughest jobs

ever undertaken. Carved through treacherous mountains, jungles and swamps it is an outstanding achievement...a worthy monument to its planners and builders, and to the efficiency of modern road building machinery. A great number of Allis-Chalmers tractors and graders are playing an important part in the building of this lifeline.

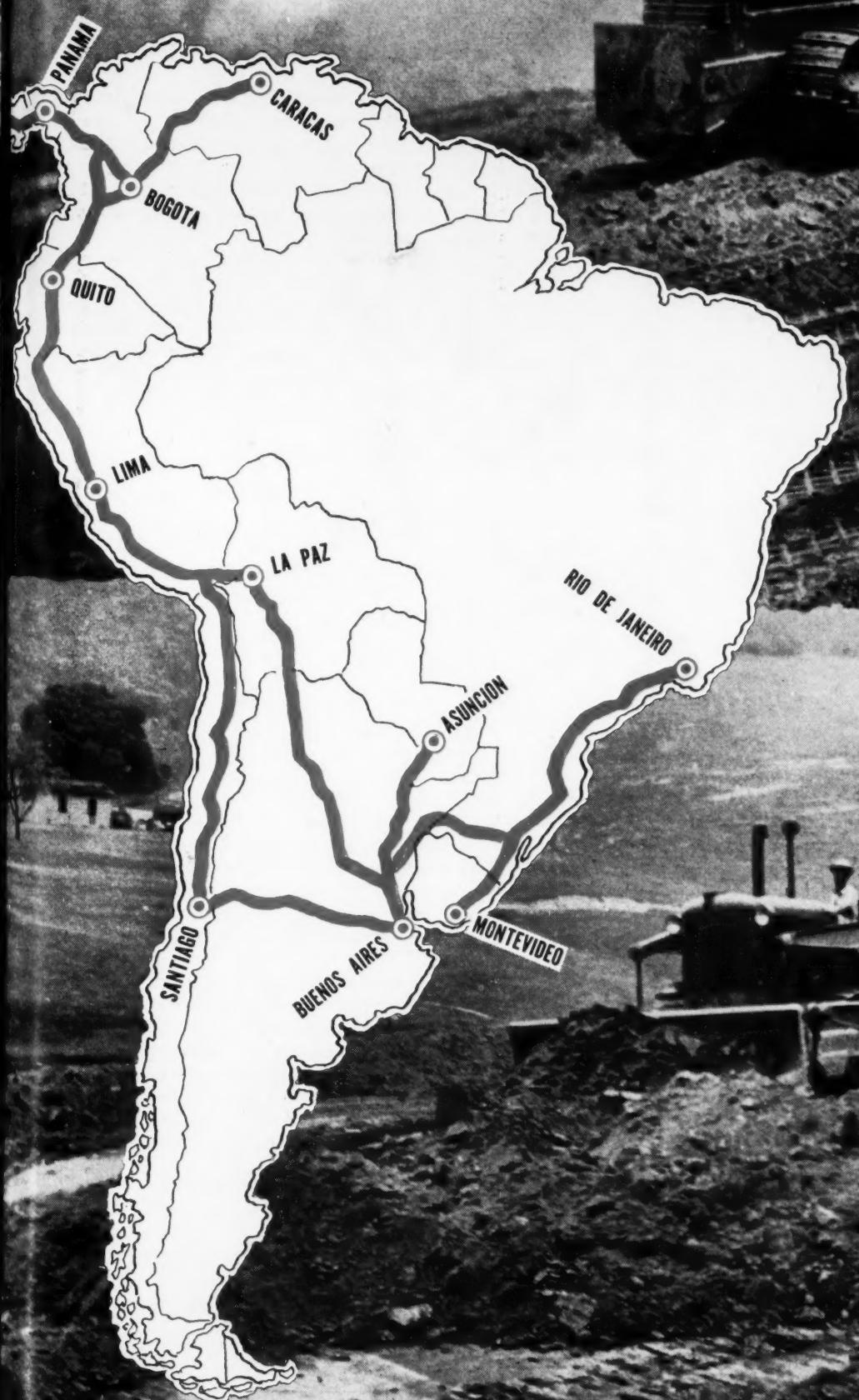


See The Movie!

Allis-Chalmers will gladly loan its film "Pan American Highway" to interested groups. In 45 minutes it takes you the length of this picturesque route in colorful Kodachrome (16 mm. sound). Make arrangements now. Write.

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From Mexico to Brazil and Argentina . . . along the entire route of The Pan American Highway . . . Allis-Chalmers 2-cycle Diesel tractors conquered every conceivable soil condition, in the mountains or through swamps. Left — HD-14 near Mexico City. Right and below — 2-cycle Diesels with Gar Wood scraper and bulldozers near Rio de Janeiro.



LEGAL ADVENTURES

of TRACTOR CONN

By LESLIE JOBB

No contractor ever tries to be his own dentist or his own shoemaker. It is even more dangerous for him to be his own lawyer. There are, however, some legal rules which every contractor should know, and these rules may be explained in plain English without resorting to the jargon of the law, unintelligible to most laymen.

This series of articles, dealing with the Legal Adventures of Tractor Conn, a typical contractor anywhere in the United States, explains some of these legal points in plain language for the contractor. Each one is based on an actual decision of an American Court.

The Case of the Architect's Authority

"And it is agreed that the said Tractor Conn shall provide all materials and perform all the work mentioned and shown in the specifications and drawings hereto annexed, and according to the terms and requirements thereof, under the direction and to the satisfaction of the architect, acting for the purpose of this contract as the agent of the said owner," a certain building contract provided. Another clause specified that the contract price was to be paid in monthly installments, on the certificate of the architect, with a 'holdback' of 10 percent.

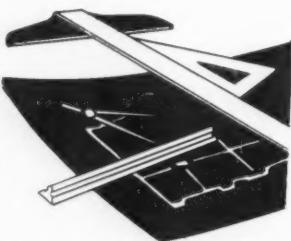
"The 10 percent that's held back each month would save me considerable financing at the bank, if the full amount could be paid to me," Conn suggested a few months later.

"Your work has been very satisfactory and I'll agree to waive the holdback and pay you the full amount each month," the architect suggested.

"Have you authority to make that change in the contract?" the careful Conn queried.

"Certainly, for the contract says that I am agent of the owner," the architect contended. The owner refused to agree to the architect's arrangement and the matter came before the Massachusetts Supreme Court.

"The architect was my agent for the purpose of deciding whether the work was done according to the contract. His authority went no further and he had no right to waive the terms of the contract," the owner contended and the Massachusetts Supreme Court so ruled in a case reported in 179 Mass. 439.



This decision is in line with other American cases laying down the general rule that an architect, as agent for the owner, cannot bind the owner beyond the strict terms of the contract itself, unless the architect has special authority.

The Case of the Defective Material

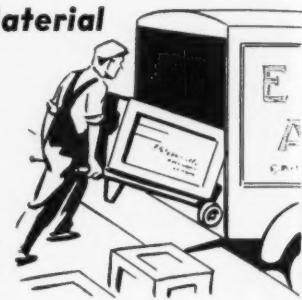
"Provided, however, that the said contractor shall have no claim against the said owner for any delay or expenses caused by the failure of the owner to deliver material as specified in this contract," a certain building contract specified. The owner delivered the material on time, but some of it was defective and had to be altered. Tractor Conn claimed damages for the delay and the expenses of alteration.

"You should have objected to the defective material as soon as it was put on the ground," the owner argued.

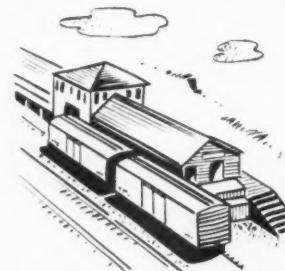
"The defects could not be discovered until the material was ready to put in place," Conn proved.

"Then, if that is true, you have no claim, as the contract says that there can be no claim for delay on account of delivery," the owner argued as a last resort.

The United States Supreme Court however, in the case of Wood vs Ft. W. 109 United States, 312, ruled in Tractor Conn's favor, on the ground that the owner was protected only against delays in delivery, not against expenses caused by the defective character of the material delivered under the contract.



The Case of the Storage Charges



"Provided, however, that the said flooring. The flooring arrived in due course and the freight agent notified Conn. He paid the freight first, removed some, and inspected afterwards.

"This flooring is not worth carrying home and I'll not accept it," Conn declared.

"Well, you'd better take it up with the shipper right away, for there will be storage charges day after tomorrow," the freight agent pointed out.

The shipper refused to take back the flooring and it remained in the possession of the railway company for nearly two weeks. Finally, Conn billed it back to the seller.

Then the railway company demanded storage, Conn refused to pay it, the railway sued, and the Georgia Court of Appeals ruled that Conn was bound to pay.

"But where, under the contract of purchase and sale, goods are shipped in a single lot to the vendee, who accepts them, pays the freight, and actually removes and retains a portion thereof, but afterwards returns to the carrier a part of the goods so removed, and, with himself designated as consignor, returns all the unused portion of the shipment to the vendor, he is liable to the carrier for storage charges which accrued on the goods after their acceptance by the vendee and pending his negotiations with the vendor for their acceptance and return, irrespective of any equities which might exist as between himself and the vendor," said the Court in 126 S.E. 896.

**More Legal Adventures of
Tractor Conn Next Month**

POST-WAR CONSTRUCTION

Realistically Appraised

American Contractors Will Play Small Part in Rebuilding Europe...

South American Prospects Slim...Best Investment Now Is in Personnel

The following address was made by Mr. McMenimen Feb. 7 in accepting the 1945 AWARD FOR CONSTRUCTION ACHIEVEMENT given annually by THE MOLES, New York organization of tunnel and heavy construction men.

By WILLIAM V. McMENIMEN

Vice-President and General Manager,
Raymond Concrete Pile Co., New York

ican contractors must do a large amount of this reconstruction. I agree that the United States will play a large part in this reconstruction, but I do not believe that we contractors will do any great amount of this rebuilding.

The need in Europe for materials and equipment will be great, and it is practically certain that we shall furnish a large portion of this equipment. However, England, France and Italy are coming out of this war in an impoverished condition and will be confronted with the same problem that we must face, that is, to give opportunity for work to their present war workers and their returning servicemen.

Material and Equipment

The furnishing of material and equipment for reconstruction abroad will undoubtedly become the duty of the United States. The cost of this material and equipment will be paid for through loans made by the United States Government to the various countries. The cost of the labor on these projects, however, will not come out of United States funds but will be paid for in the currency of the country where the work is done. This money may be raised through internal loans or by the use of the printing press, which is being freely used in many countries in Europe at the present time.

Under these circumstances it is only natural that local contractors will do the work and any profits on the work will revert to the native contractors. I cannot picture these foreign governments paying interest on money borrowed in the United States to pay profits to American contractors. It may be true that there will be projects where the technical skill of our engineers will be required, but these services will be used possibly only in a consulting capacity. The nationalistic spirit is too strong in England, France and other countries to invite American competition; and even if this nationalistic spirit did not exist, the economic factors would prevent the use to any great extent of American contractors.

In pre-war days some American contractors carried out construction projects
(Continued on page 144)



WILLIAM V. McMENIMEN, winner of The Moles' Award for Construction Achievement.

of uncertainty may cover eighteen months or more. If this is true, we then have not only the period from now to the end of the European war but also a period of eighteen months after the European war when contractors must find some way to keep busy. It is only natural, therefore, that careful consideration is being given by wise contractors to the solution of the problem of what can be done during this interim period.

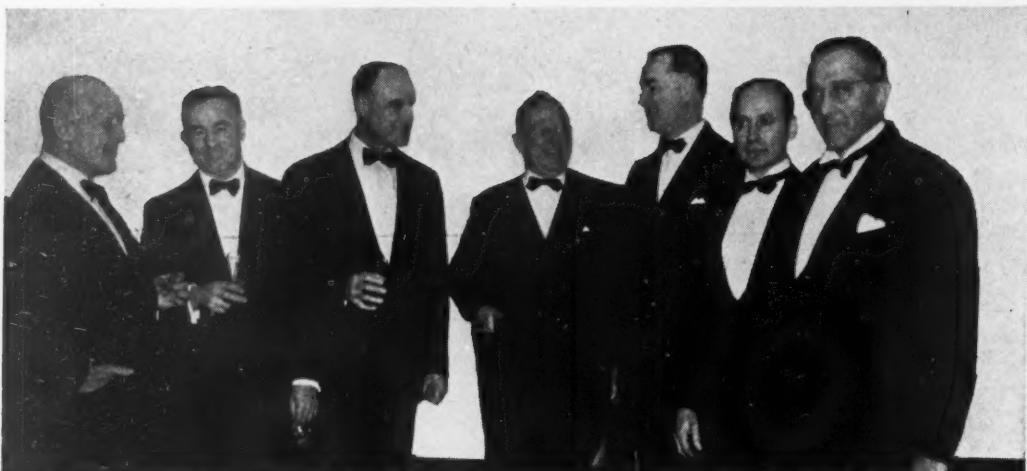
Rebuilding of Europe

It is true that the damage done abroad has been enormous and a tremendous rebuilding program in Europe must be started at once. There are many people in this country who insist that we Amer-

Let us consider the first question, which is so important to all of us. We know that at the present time there is a decided reduction in the volume of construction business and that until the end at least of the European war there is not much hope for an increase in business. During this period there will not be enough business to keep us all going. We must recognize that after the European war is ended there must be a period of adjustment, or let us call it a breathing spell, when everyone is considering how conversion can be quickly effected. There will undoubtedly be a tremendous surplus of all kinds of materials and equipment. Some of this surplus can be used on work which can be started promptly, but the amount of work which can be started promptly is questionable. Various planning boards throughout the nation have been studying new projects and some of these are undoubtedly ready to start, but even well-planned projects may not commence for some time after the close of the Japanese war. Even if they do, there will not be enough work to keep us all busy.

Industrial plants have been greatly expanded and it is unlikely that much new expansion can take place during the first year or year and a half after the end of the war. There are so many factors entering into conversion to peace-time methods that I do not believe I am unduly conservative when I state that this period

Present and Accounted For...A PAGE OF PERSONALITIES



SEVEN PRESIDENTS, past and present, of The Moles, New York organization of tunnel and heavy construction men, meet at annual Award Dinner Feb. 7. They are (left to right): ARTHUR A. JOHN-SON, Arthur A. Johnson Corp., incumbent, and his predecessors, JOHN S. MACDONALD, Walsh-Kaiser Co.; ALEXANDER LYLE, The Carleton Co., Inc.; ALEX M. STAGG, A. M. Stagg Lumber & Coal Co. Inc.; RAY N. SPOONER, Allen N. Spooner & Son, Inc.; ALBERT V. SIELKE, consulting engineer; and HARRY A. LEEUW, of Spooner organization.



NEWLY ELECTED PRESIDENT of General Contractors Association of New York is CHARLES B. SPENCER, vice-president, Spencer, White & Prentiss, New York City underpinning and foundation specialists.



NEW OFFICERS AND DIRECTORS of Associated Equipment Distributors are (seated, left to right): F. B. McBATH, Portland, executive vice-president; H. O. PENN, New York, president; GEORGE N. BECKWITH, Pittsburgh, vice-president; HAL M. DAVIS, Houston, vice-president; W. W. BUCHER,

New York, treasurer; CAROL W. WINCHESTER, Washington, D. C., executive secretary; (standing, left to right): JOHN GORMAN, Providence; E. F. HIGGINBOTHAM, Memphis; A. E. HANNAN, Atlanta; C. F. HALLADAY, Sioux Falls, S. D.; L. C. BASHAM, Charleston, W. Va.; A. F. GARLING-

HOUSE, Los Angeles; WILLIAM T. WALSH, Cleveland; BOYD DALE, Newark; T. F. JUST, Montreal, Canada; and THOMAS N. WEBSTER, St. Louis. HAMILTON O. PENN (below), who was elected president at 26th annual A.E.D. meeting in Chicago, Jan. 22-24, is president of H. O. Penn Machinery Co., of New York.



NEW YORK YANKEES, American League baseball club, is now partly owned by DEL E. WEBB (left), vice-president, Del E. Webb Construction Co., of Phoenix, Ariz. Pictured with him are EDWARD G. BARROW (center), chairman of board of directors of Yankees, and COL. LELAND S. (LARRY) MAC-PHAIL, who with Mr. Webb and Captain Dan Topping, purchased Yankee club, stadium and minor-league properties for \$3,000,000.

Press Association Photo



SPECTACULAR LOGGING ROAD JOB A TRIBUTE TO *Timken Rock Bits*



Another view of road cut out of solid rock.

Up in the big timber country of Oregon a group of major logging operators are engaged in a joint project involving the construction of 48 miles of private logging road to open up new timber territory estimated to contain billions of feet of fir and hemlock. The road is being driven through virgin forests and for considerable distances literally has to be cut out of solid rock. One such stretch — 8 miles long — is being constructed by Strong & McDonald, well-known northwest contractor, at an estimated cost of \$384,000. The photographs reproduced here were taken in this sector.

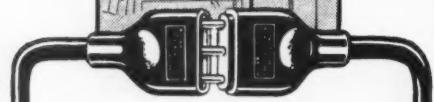
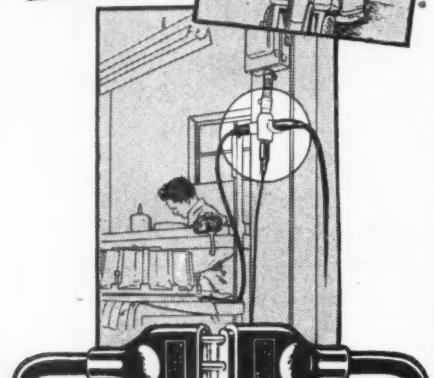
Timken Rock Bits are used for all drilling, the rock encountered being an extremely hard metamorphic

sandstone. One of the drill runners said it was the consistently hardest rock he had come up against in his 25 years of experience.

In spite of the difficult conditions however, Neil R. Miller, superintendent for Strong & McDonald, reports he is satisfied that Timken Rock Bits are helping to keep drilling costs down to a minimum. He also states that he is getting good service from Timken Bits reconditioned in a Timken Authorized Bit Service Shop in Portland.

If you are not using Timken Bits you are passing up opportunities for savings on every job you do. Write for address of nearest Authorized Distributor. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN
TRADE MARK REG. U. S. PAT. OFF.
ROCK BITS



MINES

Water-Seal Cable Connectors Transmit Power to the Job Safely and Efficiently

Mines Cable Connectors are molded right on the rubber cable so that the connector becomes a part of the cable itself. The spring pressure female contact and the patented water-seal assure you a positive connection with the male connector for efficient power supply to any machine under all plant conditions.

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For efficient, safe, flexible power transmission by cable, use Mines Connectors — "The Connector with the Water-Seal."

WRITE FOR BULLETIN MC-106, showing many successful applications of Mines Connectors throughout industry.

MINES EQUIPMENT COMPANY

4240 Clayton Road
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CONSTRUCTION EQUIPMENT NEWS

MARCH, 1945 REVIEW of Construction Machinery and Materials

VITRIFIED CLAY PIPE, known as Staminite pipe, is now being used in extensive modernization of railroad bed drainage because this type is not on the list of critical materials and because it affords a low initial expenditure and negligible maintenance costs. It also provides long-life in-

color properties entirely acceptable to users; durability in accord with a quality cement, and strength to meet all requirements.—Universal Atlas Cement Co., 135 E. 42nd St., New York City.



stallations, drains at higher velocity, starts flowing sooner and continues to discharge longer because of its cradle design construction. It will not rust, corrode, disintegrate, is impervious to action of deteriorating agencies, and has great structural strength. This pipe has all advantages of Skip pipe, plus a center structural reinforcement which permits its use for special applications where extra-heavy surface loads are encountered. It will support a drive-over weight in excess of 10,000 lb. In recent laboratory tests, Staminite pipe supported 19,000 lb. per lin. ft. or 38,000 lb. per 2-ft. section.—Robinson Clay Product Co., Akron, Ohio or W. S. Dickey Clay Manufacturing Co., Kansas City, Mo.

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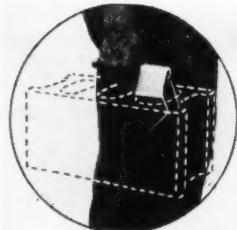
MORTAR CEMENT, developed as a result of years of research, is a plastic, smooth and buttery-like product, which spreads and trowels easily, a quality of first importance to masonry contractors since it tends to keep bricklayers and masons better satisfied and therefore more productive. Another point which the company stresses as of particular interest to masonry contractors, especially on large jobs, is yield—the amount of mortar produced by a bag of cement and the number of bricks, blocks, tile or other units that can be laid with the resultant mortar. Among other qualities attributed to this cement are low volume change;

★ ★ ★



CONCRETE BLOCK LIFTER

speeds loading and unloading of trucks because two blocks can be handled by one man at one time; Other advantages: (1) blocks are handled with fewer broken corners and edges; (2) time and money are saved because more blocks can be handled with less exertion; (3) saves gloves because none is needed; (4) prevents mashed fingers. This block lifter is said to be sturdy and inexpensive, simple to operate and easy to handle.—Michigan Silo Co., 2632 S. Washington St., Peoria 2, Ill.

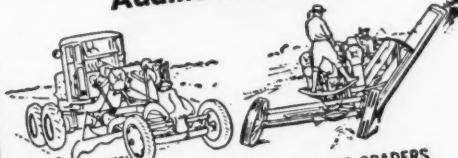


NEW ROADS FROM BANK TO BANK...



with ADAMS MOTOR GRADERS

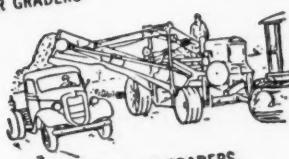
Ask Your Dealer About These
Adams Machines



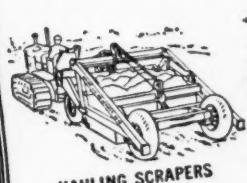
MOTOR GRADERS



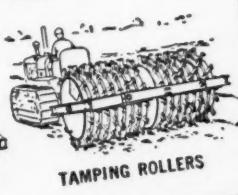
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ELEVATING GRADERS



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*ADAMS MOTOR GRADERS are among the most versatile of all road-building machines. On most jobs—building new roads, or rebuilding and widening old ones—they handle *all* of the earth-moving involved. They cut and slope banks, build ditches and road beds . . . and do the work exactly to specifications!

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ROAD-BUILDING AND EARTH-MOVING EQUIPMENT

AMERICA WANTS COMPETITION

Only American Initiative Can Preserve It in World Trade

AMERICANS generally agree upon what constitutes a desirable pattern of international economic relationships. We want an expanding world trade, with minimum recourse to government-imposed trade barriers and discriminatory trading arrangements, and offering ample scope for competitive private enterprise. Because they are necessary to such trade, we want also stability of exchange rates, and national currencies that are mutually convertible at least for the settlement of current accounts. We want, too, arrangements to facilitate long-term capital loans with security to the lender and advantage to the borrower.

Few other nations subscribe to these aims with enthusiastic conviction. Some reject them flatly as impractical under the conditions likely to prevail during the postwar period, or achievable only at prohibitive cost to their domestic economies.

Unless, therefore, we can formulate a practical and comprehensive program to carry out our aims, and convince other nations that we will take a sustained and responsible part in making it effective, the international trade of the world surely will be conducted under a system of exchange controls, bilateral agreements, cartel bargains, import quotas, and direct government purchasing arrangements that are the very antithesis of the competitive system that we favor.

To agree upon a concrete American program, and to convince other nations that it is to their advantage as well as ours to accept it, is a major task of economic statesmanship. It entails reversing a trend which has persisted since World War I, and which has been intensified during the depression years of the nineteen-thirties and by the exigencies of World War II.

Clearly, that is not a task to be assumed lightly. We can hope to be successful only if (1) we have a deep conviction that what we seek is fundamentally important to the American interest, and (2) if we will take pains to understand why other nations fear that such a program may jeopardize their interests, and then make whatever accommodations may be necessary to resolve their doubts.

An expansive foreign trade policy has been advocated so vigorously and repeatedly in America recently that The Economist (of London) comments wryly upon what it terms the ironic circumstance that "the acceptance of the principles of free trade by the more literate (American) public should come at a time when the doctrines in their simplest nineteenth-century form have been pretty generally emasculated in fact and repudiated in principle by the rest of the world".

* * *

Why are we opposed to managed world trade, and for competitive world trade?

First, we are against rigged and managed international markets because we know that successful partici-

pation necessitates a comparable degree of control over the domestic economy as well. There is little debate of this fact, and those nations which accept a managed external trade as a necessary protective measure are generally willing to pay the price in internal regimentation. We are not. For us to do that would be as alien to our genius as it is repugnant to our conviction.

Second, we believe that the United States will be able to compete successfully in world markets, even though we have, and intend to maintain, wage scales far higher than those of the nations whose competition we must meet.

There is impressive evidence to substantiate the soundness of this conviction:

1. Wage scales, of themselves, do not determine the competitive position. They are meaningful only when translated into labor costs, by dividing wage rates by units produced. A recent War Production Board study shows that in manufacturing industries generally, during the period immediately before the present war, production per man hour in the United States exceeded that in the United Kingdom, Germany and Soviet Russia by a ratio of more than 2½ to 1, and that of Japan by more than 4 to 1. When comparison is made with available wage data, it appears that our labor costs are generally on a competitive plane.

2. Perhaps the best evidence of our ability to compete in export markets is the record of our demonstrated capacity to do so in the past. During the entire period between World Wars I and II, the United States consistently commanded a greater share of the world's export trade than any other nation, although the United Kingdom took a larger percentage of world imports.

3. We have been particularly successful in world trade competition in the export of machinery, vehicles, a variety of manufactured specialties, and certain agricultural products. Except in the last-named field, there is every evidence that we enjoy genuine competitive advantage over other nations, and this advantage will have been increased rather than diminished by developments during the Second World War. It is noteworthy that the goods in which we have been able to compete most successfully have generally been the products of our high wage industries rather than those in which low wages have prevailed.

* * *

It is clear that, on a price basis, we shall be able to compete successfully in postwar markets in numerous lines. It is equally clear that such an opportunity is by no means of negligible importance to our own economy as a whole. During the years in which the censuses were taken between 1909 and 1939, our exports amounted

to from 7 to 16 per cent of our entire production of movable goods. In the year 1938 our exports in each of the following lines accounted for more than 10 per cent of total domestic production of the particular product.

(The figures in parenthesis are the percentages of total production exported.)

CRUDE MATERIALS: Phosphate rock (51.5), cotton (30.5), tobacco (29.4).

FOODSTUFFS AND BEVERAGES: Linseed (49.4), dried fruits (36.2), canned sardines (29.4), rice (21.0), fresh pears (15.9), canned salmon (13.8), canned asparagus (13.2), canned fruits (13.0), wheat (12.2), lard (11.7).

SEMI-MANUFACTURES AND FINISHED MANUFACTURES: Refined copper (53.1), paraffin wax (46.3), gum turpentine (42.6), carbon black (40.8), gum rosin (38.0), borax (35.9), crude sulphur (35.6), aircraft and parts (26.8), office appliances (22.3), carbons and electrodes (21.8), printing and bookbinding machinery (18.2), agricultural implements and machinery (17.0), biologic pharmaceuticals (15.3), industrial machinery (14.4), dental instruments and supplies (14.3), automobiles (14.1), benzol (13.3), goat and kid upper leather (12.8), refined lead (12.0), radio apparatus (11.8), caustic soda (11.4), refined mineral oils (10.6).

It is of major concern to all engaged in these lines of activity and in many others that foreign markets be not closed to us. It is particularly to our interest to have export outlets for our war-expanded capital goods and equipment industries. Since we undertook an important percentage of such expansion in order to furnish munitions to our Allies, it is reasonable to ask their cooperation in cushioning what inevitably must be a drastic readjustment here. The case is strengthened by the fact that the postwar world will desperately need the equipment items that we, alone, can supply.

But our demonstrated ability to compete on a price basis will not, of itself, assure us of foreign market outlets. Transportation costs, quality of product, marketing skill, technical and repair service—all are basically important. Still more important are non-discriminatory open markets and the command of dollar exchange by prospective purchasers. Our export potentials will surely be cramped in a world organized on the basis of bilateral deals and exchange controls. The availability of dollar exchange must depend upon the level of American imports and the volume of American capital loans.

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How are we to explain the skepticism of other nations toward an order which to us seems so clearly to represent not only our interest but the long-range interest of the world as well?

Soviet Russia, of course, is committed to conducting its external trade through its central government. But what of the United Kingdom? Why are there so many British voices that counsel the abandonment of what has been Britain's traditional position for more than a century? If we can understand that, we shall understand the dissent from our position of most nations whose economic positions have weakened and whose fiscal problems have multiplied during the two World Wars and the ill-starred period between them.

Essentially, their case is this:

Partly, they were forced into managed external trade policies by the Axis self-sufficiency programs, adopted in preparation for aggressive war. That can be corrected only by crushing the Axis, and by establishing a world security system that will make self-sufficiency a less compelling need.

But primarily, the reluctance of peaceably inclined nations to forego restrictive controls over postwar foreign trade stems from a deep-seated fear that is even more difficult to resolve. They fear, on the basis of past experience, that their efforts to meet payment balances arising from normal foreign trade would force a deflation of their internal economies, affecting prices, credit, wages, and finally employment. Faced with the choice, as they see it, between making adjustments in foreign trade or in their domestic economies, they lean toward the former as, at worst, the lesser of two evils.

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Since the kind of world trade system we seek is dependent upon international arrangements to assure reasonable stability of exchange rates between national currencies, we are challenged to find a formula that both will provide this and at the same time allay what other nations believe are legitimate fears with respect to their domestic economies.

But at least two major steps toward resolving such doubts can be taken upon our own initiative without recourse to the intricate process of international negotiation.

One is the rational overhauling of our tariff system, to provide other nations with increased opportunity to export to us. We can, and should, do this in a way that avoids undue cost to any segment of our economy.

The other, and probably the greatest contribution we can make toward winning a reluctant world to our point of view, will be to offer ample and convincing evidence that we are ready and able to provide a high level of employment in the United States. If we can do that, the rest of the world will wish to expose itself to our influence rather than to insulate against it, since prosperity here is the greatest single contributing factor to worldwide prosperity.

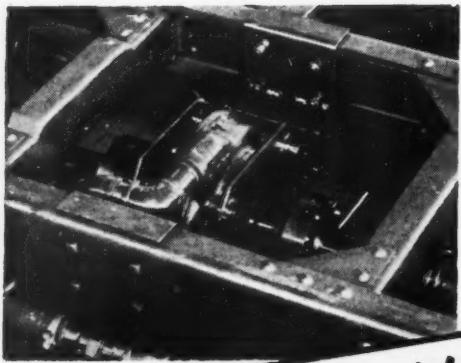
Balance of payment problems are minimized in a world of thriving trade. Britain would have little reason to resort to exchange controls if the total of postwar world imports and exports reaches an 80 billion dollar level. She may well be in a desperate plight if it should revert to the 1935 level of 40 billions.

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The United States wants a world in which private enterprise and competition play a major role. To obtain such a world will require a wiser, more understanding and firmer world leadership than this nation, or perhaps any nation, ever has exerted heretofore.



President, McGraw-Hill Publishing Co., Inc.



Takes the Downhill
Wear and Tear Off
TIRES-BRAKES-ENGINE

The PARKERSBURG HYDROTARDER

Never has it been so necessary to safeguard these vital elements of your trucking equipment. And there's no better way than equipping your truck fleet with Parkersburg HYDROTARDERS.

Mounted on the drive shaft between transmission and differential, they absorb the power . . . retard the speed of trucks on down grades without use of brakes or low gears. Uniform, safe, legal speed is maintained throughout the descent by the "choke type" control on the instrument panel, relieving the brakes and engine of this strain.

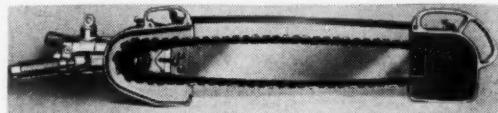
After thousands of miles of operation truck owners report savings of 25% in tires, 8% in fuel, 85% in friction brakes and 15% in time. It will pay you to investigate the HYDROTARDER and how it pays for itself in savings on maintenance costs.

Parkersburg HYDROTARDER

Distributed by

HETZEL BROTHERS, Engineers and Manufacturers
1972 Los Angeles Street Los Angeles 11, California
THE WINTER-WEISS COMPANY
22nd and Blake Streets Denver 2, Colorado
THE POINTER-WILLAMETTE COMPANY
238 N. E. Oregon Street Portland 14, Oregon

AIR-DRIVEN POWER SAW, especially useful for carrying on cold weather operations, is lightweight (42 lb.) model with cutting capacity of 24 in. Operated by 3½-hp. motor using 90 cfm. of air at 90-lb. pressure. Cuts through soft wood at an average of about an inch per second, hardwood in about double this time and through standing trees within 2 in. of the ground. Features: (1)



Links with permanently welded hook form of construction can be assembled or disassembled in 5 min. by hooking or unhooking; (2) narrower kerf with sequence of four teeth uses less power, offers greater strength and gives faster cutting action; (3) safety guard full length of top gives positive protection when machine is in operation, (4) quickly detachable "helper's end" may be removed easily if saw becomes pinched by the log or for use by one operator instead of the usual two. When single operator uses unit, weight is supported by strap from operator's belt to ring in saw, making it easy to handle. "One shot" lubrication feature assures long life. A 5-hp. 36-in. cutting blade is available if desired for use with this unit and 24- and 36-in. electric models may also be obtained.—**Lombard Governor Corp.**, Ashland, Mass.

★ ★ ★

ALL-PLASTIC GOGGLES, named Looks, and featuring lightweight, wide vision and comfort, are suitable both for men and women, are designed to fit facial contours and yet to provide a close and comfortable seal around the eye orbits. Large "aviation type" lenses afford a wide unobstructed angle of vision. Frame available in two styles: (1) gen-



eral purpose model providing direct ventilation through holes at top and bottom of eye cups, and (2) dust model with indirect ventilation through serrated lens seats. All lenses are of polished sheet acetate, clear or green in color and are quickly and inexpensively replaced. Wide elastic headband holds goggle in place at low tension, assuring wearing ease over long periods of time.—**Mine Safety Appliances Co., Braddock, Thomas & Meade Sts., Pittsburgh 8, Pa.**

How to prevent Corrosion



Coat a section of any piece of raw metal with a protective film of Anti-Corrode. Place it out-of-doors, and leave exposed to the elements.

Rain, snow, changing temperature, dust and grime have eaten into and oxidized the unprotected metal. But note surface under Anti-Corrode film—bright and unharmed, in its original state.

CITIES SERVICE ANTI-CORRODE is a safe rust and corrosion preventive that brings amazing results. It is a reliable safeguard against corrosion of metals in any form or state of finish—whether in storage or in transit. Anti-Corrode forms a tenacious, durable film that is impervious to moisture and the more common gases prevalent in the atmosphere. And, since it contains lubricating material, it need not be removed in drawing operations. Anti-Corrode is made in several grades to meet specific requirements and severest tests. It is economical, easy to apply and can be removed with kerosene or any petroleum solvent.

Take advantage of this FREE
ANTI-CORRODE demonstration offer
Mail this coupon today!

(Available only in Cities Service marketing territory EAST of the Rockies.)



This TEAM Will Save You Money and Materials

Recently, we announced the development of Cities Service Rust Remover, and responses to the demonstration offer far exceeded our expectations. Rust Remover, of course, removes rust. Anti-Corrode is designed to prevent rust and corrosion. Together, they will safeguard your equipment and war production—for the duration!



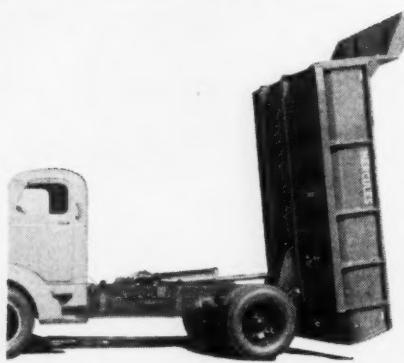
CITIES SERVICE OIL COMPANY
Room 232, Sixty Wall Tower, New York 5, New York
Gentlemen: I would like to test Anti-Corrode on my own equipment FREE OF CHARGE. Please send me the details.

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Company _____
Address _____
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**For Every Dumping Job, There's A
HERCULES HYDRAULIC
Dump Body and Hoist**



Hercules Removable Side Rub Rail Body With Hinged Rear Corner Post.

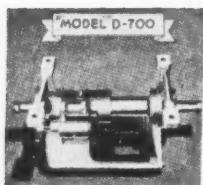


Hercules High Dumper-Power Up, Power Down, with 78° dumping angle. Hoist capacity 12 tons.

Many other body styles in many sizes, and 6", 7", 8" and 10" Hoists, are available.

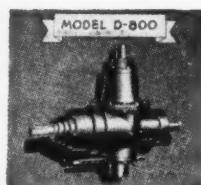
USE THE HERCULES SPLIT-SHAFT POWER TAKE-OFF

To operate any truck-mounted equipment



Direct (D-700 Series), Side (D-800 Series) and Dual Drive (B) models are available for operation of almost every possible type of truck-mounted equipment, either singly or in combination.

Recommendations and complete specifications upon request.



**A HERCULES
HYDRAULIC
BOOSTER
HOIST**

Makes any
Truck A
**DUMP
TRUCK**



UNLOAD the EASY WAY! SAVE TIME, MANPOWER and MONEY by installing Booster Hoists under your Stake, Platform, or Special Bodies. 50° Dumping Angle will dump any material such as Coal, Grain, Earth or Sand.

See your Hercules Distributor or Write

**HERCULES STEEL PRODUCTS CO.
GALION, OHIO**

Manufacturers of Hercules Hydraulic Hoists, Dump Bodies, Split-Shaft Power Take-Offs and "Power-Chute" Hydraulic Coal Unloaders

THREE-POINT PIPE GAGE, which will measure not only all sizes of pipe from $\frac{1}{8}$ to 12 in., but also all sizes of electrical conduit and metallic thin-wall tubing, is pocket size and consists of two pivoted steel plates with edges curved at three points for contact with the pipe or tubing to be measured, together with scales which automatically register standard sizes of metallic tubing and also correct sizes of pipe in terms of inside measure-



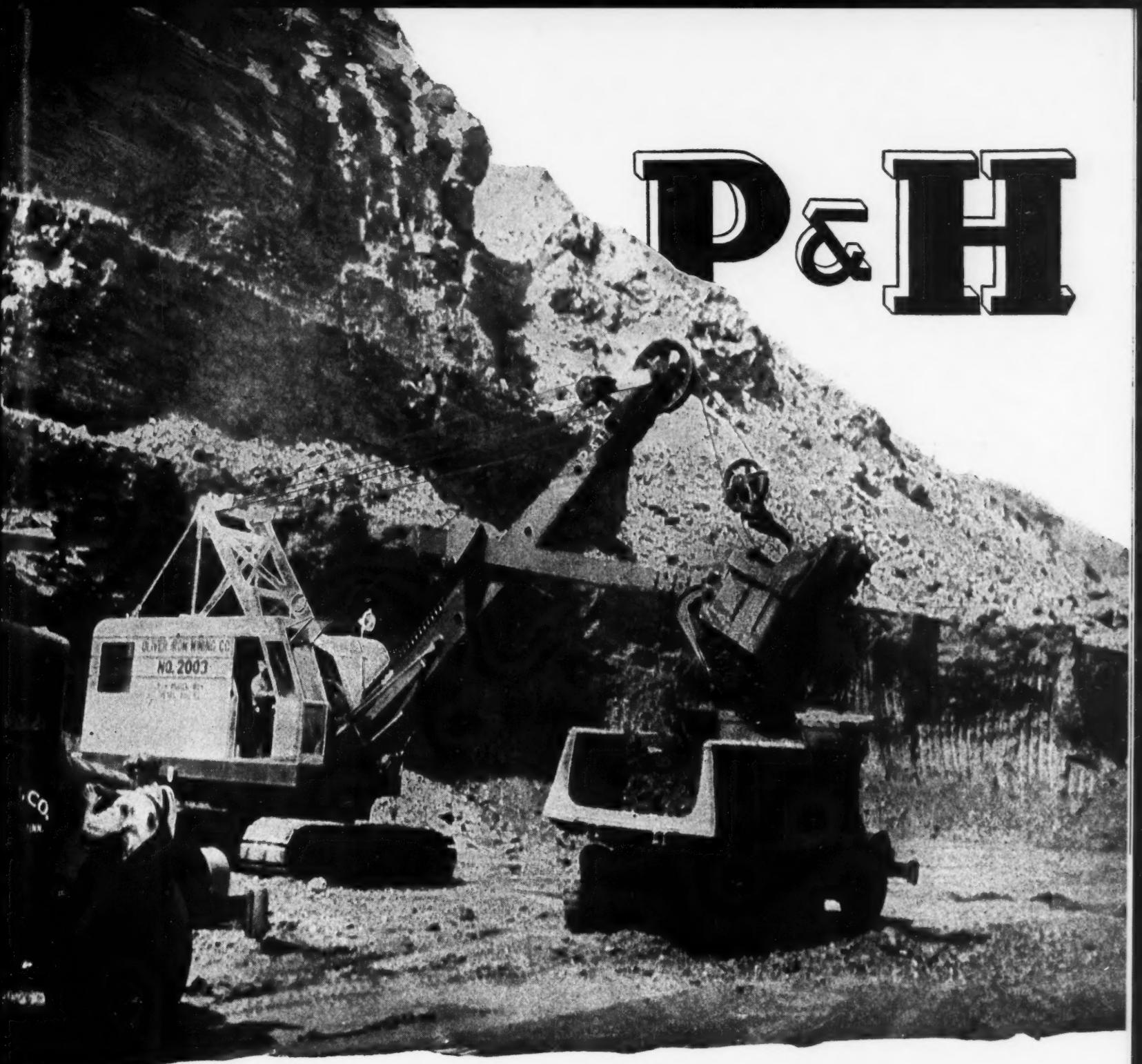
ment. Third scale shows right drill size for tapping. Also included is handy inch rule and metric rule. Device measures by simple, practical method of determining outside arc at three points of contact, and by placing two fixed contact points of one plate against outer contour of pipe or tubing and sliding second or movable plate until it makes third contact, markers on face of gage will show accurately size of pipe, conduit or tubing and also correct drill size for tapping. Advantages: (1) Necessary to contact only small section of pipe or tubing contour; (2) gage will measure in any position, even against wall or corner; (3) covered pipe or tubing may be measured by placing it between covering joints or in small opening near union or other fitting; (4) may be used in dark places, then carried to light and read; (5) constructed of steel, finished in black rustproof finish, with deep etched numerals filled with white enamel. Size, when closed, is $2\frac{3}{4} \times 4\frac{1}{2}$ in.—Three-Point Gage Co., 3821 Broadway, Chicago 13, Ill.

★ ★ ★

HOLDER FOR WELDING ELECTRODES, said to be unusually light in weight and low in cost, has current rating of 300 amp. with ample capacity for overload and handles various sizes of electrodes ranging from $1/16$ in. to $1/4$ in. in diameter. Jaws,



made of high conducting and wear resisting copper alloy will withstand rough treatment and are fully guarded from contacting work by durable spring steel insulating guard, easily replaceable. Trigger of holder is of molded, heat-resistant inorganic material. Other features: hollow, air-cooled, heat-resistant fiber handle, excellent balance and equally good performance on both ac. and dc. currents. Designed to hold electrode securely at any angle, and yet to permit quick and easy change of rods.—The Lincoln Electric Co., Cleveland, Ohio.



P&H

Expect These Things From P&H

SMOOTH PERFORMANCE. From smooth-rolling crawlers, operating on the true roller-chain principle, to boom point sheave...in every detail of design, these P&H's are built to reduce friction and eliminate strain.

EASY OPERATION. Smooth, responsive hydraulic control. Here's swift, velvety action that is easier on the machine, easier on the operator.

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ADDED VALUE. Many of P&H's exclusive refinements might have been withheld. But they are included be-

cause they save you time and money in the long run. P&H's added values protect your investment in excavating equipment. Ask for the proof!

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P&H Excavators are built in sizes up to 6 cubic yards capacity with gasoline, Diesel or electric power. Write for literature.

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Preformed wire rope

CUTS PRODUCTION COSTS 3 WAYS

One reason is enough—but here are *three* reasons why Preformed wire rope cuts production costs:

1. Preformed lasts longer; pays bigger dividends on wire rope dollars.
2. Preformed rotates less. You don't have to repair or replace sheaves, drums and rope so often.
3. Preformed winds easily on drums. You encounter fewer delays. Your men and machines produce more per day, per month, per year.

Thousands of operators have standardized on Preformed—and use nothing else on tough wire rope jobs.

**ASK YOUR OWN SUPPLIER FOR
PREFORMED WIRE ROPE**



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MONOTUBES GO TO ANY LENGTH...

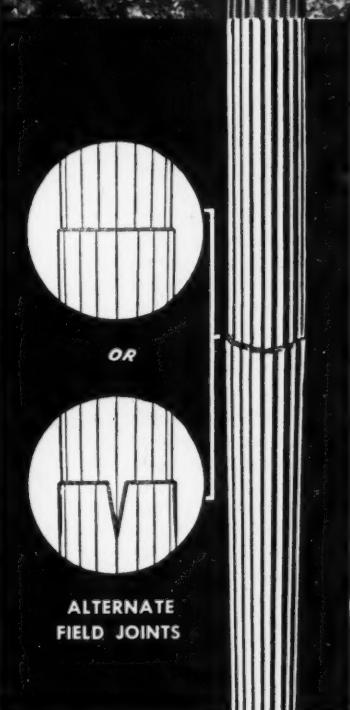


... to insure a BETTER FOUNDATION

TO the engineer and contractor Monotube tapered piles offer many advantages—among them: ease of *handling*, ease of *driving*, ease of *inspection*. But the Monotube feature that rates tops with men of experience is their EASE OF EXTENSION.

Tapered, fluted Monotubes are so light in weight, so efficiently designed, they can be driven without heavy core or mandrel, and quickly extended on the job to meet any contingencies of varying soil conditions.

Remember Monotubes the next time you require piled foundations. Available in a gauge, size and taper to meet your needs. For full details and catalog, write The Union Metal Manufacturing Company, Canton 5, Ohio.



UNION METAL

Monotube Tapered Piles



M-S-A
All-Weather
FIRST AID
KITS



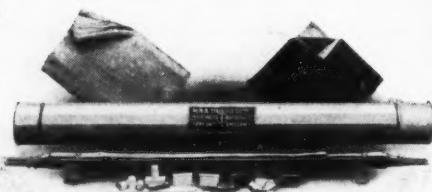
These sturdy, steel cases are dustproof and weatherproof. The unit size packages offer a maximum of varied, individual first aid treatments in a minimum of space, and assure ease of maintenance. Carefully selected fills are available in 10, 16, 24, and 36-unit size kits. Mounting brackets permit placing of kits on walls of office or trucks, permitting easy removal so that the kit may be rushed to the scene of an accident. Furnished complete with carrying handle, two snap locks and instruction and contents sheets, M.S.A. All-Weather Kits are ideal for construction jobs of all kinds. Write for Bulletin FA-70.

**FOR Efficient
First Aid**
ON YOUR CONSTRUCTION JOBS

**M-S-A STANDARD
STRETCHER
OUTFIT**

A sanitary, dustproof galvanized steel emergency outfit ideal for construction jobs. Contains, in addition to a sturdy Army type stretcher, rubber and wool blankets, splints, bandages, etc., for the care and comfort of the patient. May be readily mounted on wall, or in corner of office or truck. Available for instant use.

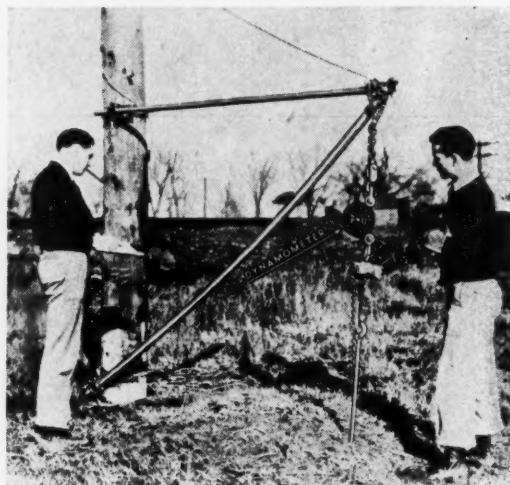
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OVERALL DIMENSIONS 96" x 10 1/2"
 PART #2344

MINE SAFETY APPLIANCES CO.
 BRADDOCK, THOMAS AND MEADE STREETS
 PITTSBURGH 8, PA.

TRACTION DYNAMOMETERS because of their versatility have found many new uses in laboratory and on production line where conventional testing methods are not practical. Among these uses are: (1) For making tensile tests on supporting structure of pilot seats; (2) friction tests made on hydraulic piston packings; (3) as highly portable and accu-

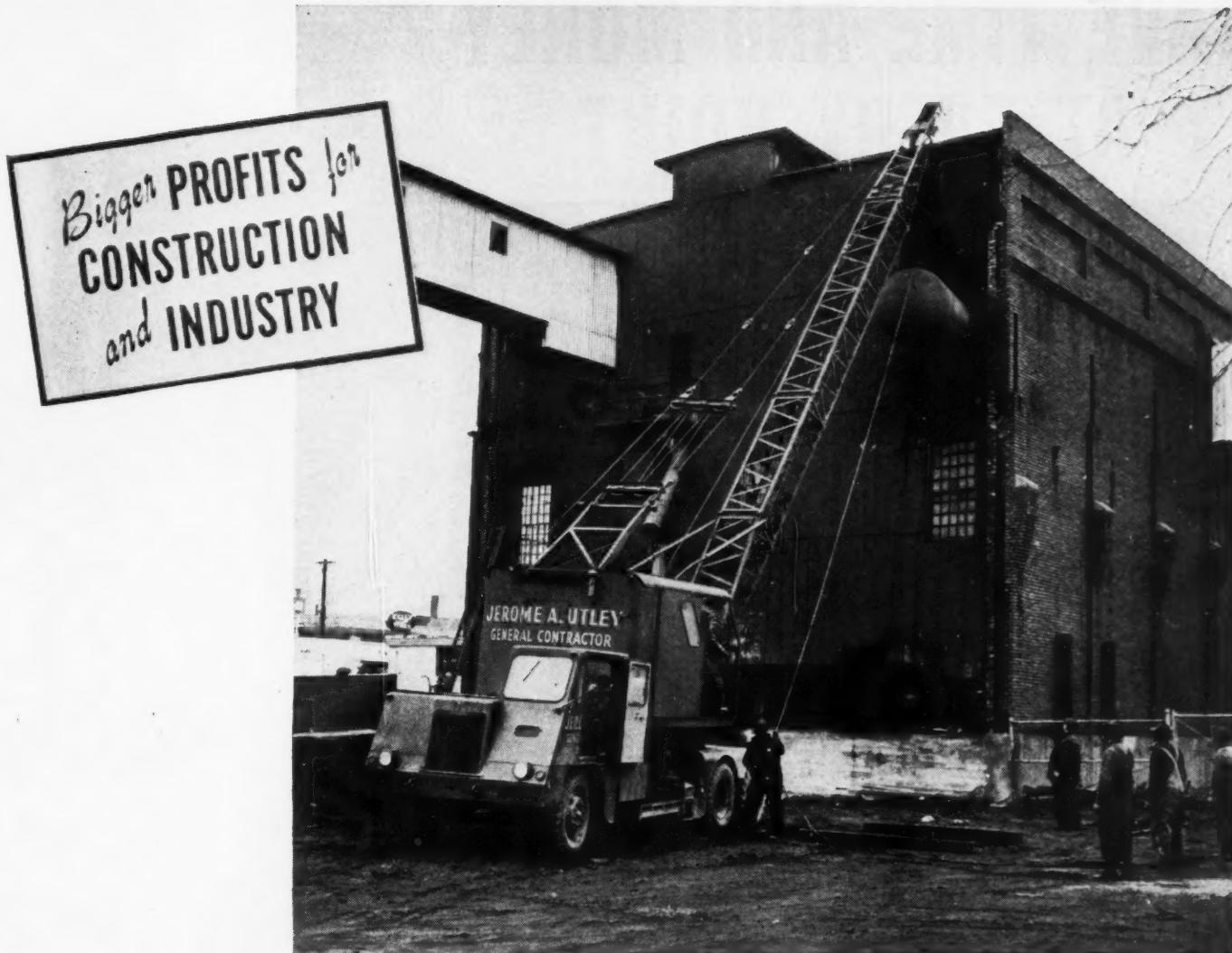


rate scales, thereby saving expense of crane scale operator and time required to handle larger and more costly unit. Reasons that make the dynamometer a many-purpose instrument: (1) May be suspended in any position, weighs only a few pounds and is not injured by accidental overload; (2) highly compact—fits into almost any mechanical setup and lends itself well to embodiment in new testing facilities. Weighs 8 lb., measures 8 1/4 x 6 1/4 x 3 in.—W. C. Dillon & Co., Inc., 5410 Harrison St., Chicago 44, Ill.

* * *

COMPRESSOR CONTROL, named "Compressor-Trol," combines seven devices for control of operations of tank-mounted compressors up to 15 hp. or 60 cu. ft. per min., eliminating necessity of using pipe and pipe fitting, simplifying installation and reducing possibility of air leakage. Made in three sizes, $\frac{1}{2}$, $\frac{3}{4}$, and $1\frac{1}{4}$ in., all determined by inlet connection. Equipped with Ashcroft Durawatch, with either an electric or mechanical attachment for operating two-way unloading valve mounted on Compressor-Trol casting. Muffler on compressor discharges into tank and acts to break up discharge and to disperse air in a manner which insures adequate mixing with cooler gases in tank to reduce temperature and moisture content before delivery. Combined Durawatch and gage has heavy-duty gearless movement, slide rule dial, horizontal self-draining and non-freezing Bourdon tube. Entire gage is completely removable and replaceable in case of accidental damage. Supplied in all standard pressure ranges.—Electro-Mechanical Div., Manning, Maxwell & Moore, Inc., Bridgeport, Conn.





CRANE MOBILE

While all CraneMobile production is going to the Armed Services, you can PLAN NOW to enjoy the bigger profits offered by this highly flexible and mobile crane. Its bigger lifting capacity, its precision operation, its speed and versatility makes it a machine of many uses from setting steel to handling raw materials and placing heavy machinery. From hub caps to boom point, the CraneMobile is engineered to the well known BAY CITY standards of real value, superior design and sturdy construction, including such advantages as pin-jointed

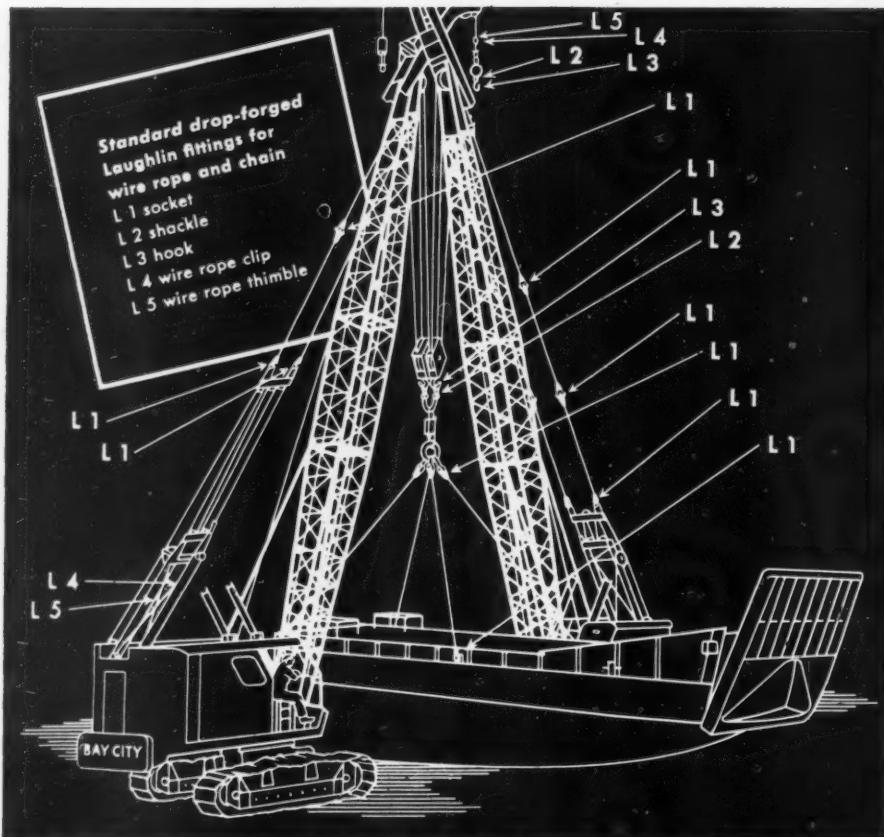
booms and jibs up to 110 ft., independent live boom hoist, collapsible Hi-gantry, boom back-stops, power load-lowering plus lifting capacities up to 20 tons and road speeds up to 35 MPH. The next time you have a difficult crane job remember that the CraneMobile can do it better and that only a BAY CITY will give you CraneMobile performance. If you would like to become better acquainted with this rig just write BAY CITY SHOVELS, Inc., BAY CITY, MICHIGAN for catalog 18-e or see your nearest Bay City distributor.



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SHOVELS • CRANES • DRAGLINES • TRENCH-HOES • SKIMMERS

SAVE TIME AND MONEY AT EVERY POINT



The L's mark the spots where you can save money in wire rope and chain fittings, by . . .

1. eliminating "specials"—Laughlin has the most complete line of drop-forged standard fittings.
2. protecting ropes and chains—husky Laughlin fittings take their full share of the load.
3. lasting as long or longer than ropes or chains.
4. protecting lives, loads, plant equipment—as with Laughlin's unique Safety Hooks.
5. reducing installation time—3 "Fist-Grip" clips do work of 4 and are quicker to install.

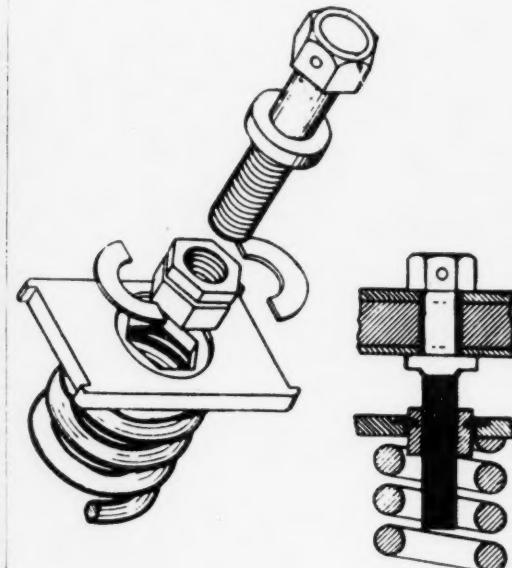
Protect your investment in wire rope and chain with quality fittings. Specify Laughlin—fittings that save you time, materials and money. Write for complete catalog. Address Dept. 1, THE THOMAS LAUGHLIN COMPANY, Portland 6, Maine. Laughlin fittings are distributed through mill, mine, and oil field supply houses.



THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



EMERGENCY SHEAR PLATES, quickly replaceable, are designed to prevent roll breakage on aggregate crushers. Heavy helical springs of chrome vanadium steel maintain proper tension on floating roll and keep opening for material constant. When uncrushable foreign material is introduced, springs protect roll by relieving undue stress and prevent



breakage. If unusually large material passes into rolls, shear plates at butt of springs snap and free springs completely. Each shear plate consists of 11-gage sheet iron and is located in slot of adjustable plate that holds spring in position, as shown in drawing. Large piece of uncrushable material, such as tramp iron, would cause nut, slotted for and holding shear plate, on end of adjustable screw bolt, to shear plate and allow unrestrained bolt to pass through spring and instantly release all tension on floating roll. To resume operation, shear plates are replaced. Extra plates are supplied with each crusher.—Iowa Manufacturing Co., Cedar Rapids, Iowa.

★ ★ ★

30-TON TWO-AXLE TRUCKS, said to be largest ever built, are now being used by a large ore producer to haul iron ore out of deep open pits on Minnesota Iron Range. Powered by supercharged diesel engines of 278 hp., these trucks have a top speed of 21.4 mph. Net weight, 46,450



lb. Tires are 16.00x32 in., 30 ply, front singles and rear duals—enough rubber to make about 165 passenger car tires of 6.00x16-in. size. Photograph shows truck equipped with body designed for heavy material; larger bodies are used for lighter materials requiring more space for 60,000-lb. loads.—The Euclid Road Machinery Co., Cleveland 17, Ohio.

Canvas Covers Winter Construction



Banish its Fire Hazard with Flame-Resisting Fire Chief Canvas

Canvas covers permit work to go on right through the winter — BUT, ordinary canvas also invites fire loss. A hot rivet, a slip of the welding torch or a hot salamander too close to the windbreak and there'll be no bonus for a job completed ahead of schedule.

It's an entirely different story when FIRE CHIEF-treated Canvas is used, because FIRE CHIEF will not support combustion. The war-proven FIRE CHIEF treatment prevents canvas from igniting. The unretouched photo at the left shows that even a welding torch cannot cause it to flame.

FIRE CHIEF has many other distinguishing qualities in addition to its fire resistance. It is also water, weather, wear and mildew resistant. It is flexible, year 'round, and it keeps its "dry" finish.

The unique FIRE CHIEF treatment is permanent. It will not bleach or wash out. FIRE CHIEF may be stored for indefinite periods and still retain all of its inherent qualities.

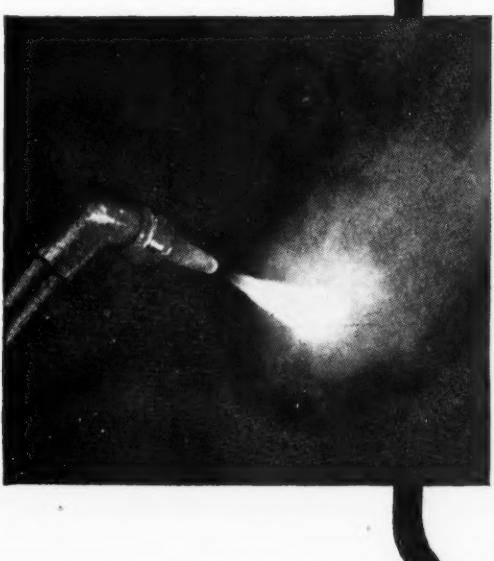
Weight for weight, FIRE CHIEF has a greater working strength, which permits the use of lighter grades. The Army has been taking advantage of this for its tents and ordnance covers . . . a considerable saving.

There is only one FIRE CHIEF treatment, thoroughly proven under all the rigors of war . . . a product of HOOPERWOOD "Canvas Engineering."

Many facts of utility to all users of canvas have been condensed into a new bulletin, "War-Proved for Post-War Service." Write for a copy.

WM. E. HOOPER & SONS CO.

New York PHILADELPHIA Chicago
Mills: WOODBERRY, BALTIMORE, MD.



• *Fire-Chief Finished* •
HOOPERWOOD COTTON DUCK

(PATENTED)



F. D. Cline Construction Company, Raleigh, North Carolina, recently completed widening of this access road to a U. S. Marine Corps Air Station and a U. S. Navy Base in eastern North Carolina. Work involved grading of more than 150,000 yds. of earth and the use of more than 70,000 yds. of concrete for paving. Gulf quality lubricants and fuels helped the contractor get top performance from equipment.

GULF QUALITY PRODUCTS

and fine service help contractor make
fast time on North Carolina road job

GULF QUALITY PRODUCTS and fine service are a big help on a rush job like this," says Superintendent E. Claude Willard of F. D. Cline Construction Company, Raleigh, North Carolina. "They contribute to fewer delays in the operation and maintenance of equipment, and help insure top performance from every unit."

This access road project is one of many rush jobs where Gulf products and prompt delivery service work effectively to insure fast progress for the contractor.

Here's why so many leading contractors specify Gulf products: They have found that Gulf lubricants provide a higher degree of protection to equipment when it's pushed to the limit—and fuels of uniform quality that contribute to maximum power and effi-

ciency. Result: fewer delays, lower maintenance costs, and better all-round job efficiency.

Call in a Gulf Service Engineer before you go to work on your next contract—let him show you how Gulf quality lubricants and fuels can help you do a speedier, more profitable job. Write, wire, or phone your nearest Gulf office today.



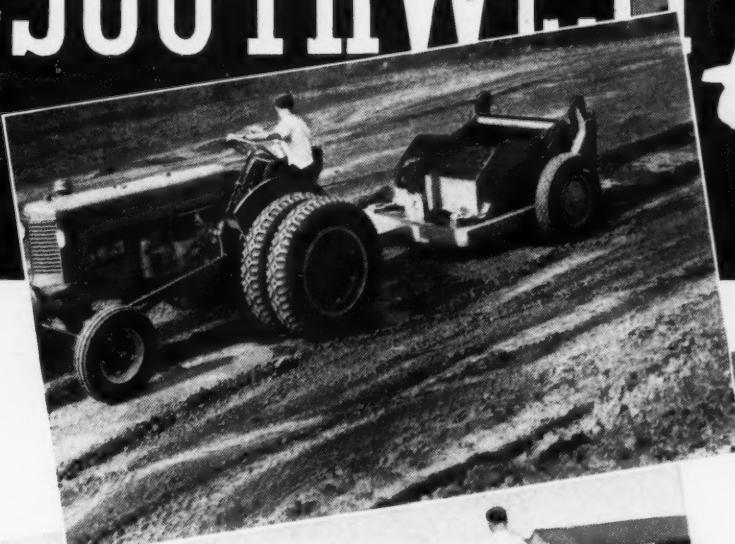
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SOUTHWEST



Hauling Scoop

... With Standard Rubber Tired Tractor . . . Ideal Combination For Maintenance And Repair

Our Highways and rural roads, overtaxed by wartime traffic, are badly in need of repair. Maintenance equipment is being utilized to the fullest extent—but requirements are continually increasing.

Modern Earth Moving methods call for speedy, economical equipment—units with all-round efficiency on every job.

Southwest proudly presents this latest development in the use of its **Single Cable Controlled Rear Dump Hauling Scoop**. Equally desirable for both on and off-highway operation where the material (not confined merely to earth moving) must be loaded, transported, and dumped in a heap or spread evenly. Elimination of extra equipment—reduction in manpower require-

ments—and lower investment are just a few reasons why it will pay you to put this combination in your equipment set-up. Write for full details.



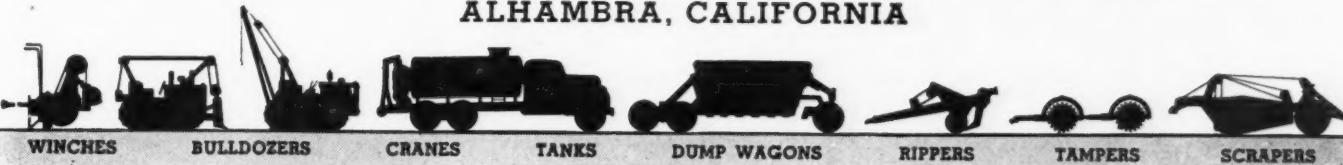
Four page bulletin available on request. Gives engineering data on the three standard sizes of Southwest Hauling Scoops. Write Department A293, Southwest Welding & Manufacturing Company, Alhambra, California.

... Easy Loading . . . Fast Hauling . . . Controlled Spreading . . .

CONSTRUCTION MACHINERY DIVISION

Southwest Welding & Manufacturing Co.

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Five Tons and It's All His

Each soldier, heading for a fighting front, is supported by five tons of supplies . . . requires one ton per month while overseas.

The Army's Transportation Corps supervises the tremendous task of getting these supplies aboard ship, sending them to overseas ports, distributing them to far-flung battle fronts. One Transportation Corps company traveled 225,000 truck miles in England and France between D-day and the end of June.

Backing up the Army's Transportation Corps on the home front, 24 hours a day and seven days a week, are America's four million commercial motor trucks.

These hard-working, highway haulers are indispensable to the production and transport of virtually every one of the 700,000 different articles of food and fighting equipment required by our millions of overseas soldiers. This is evidenced by the estimates that 75 per cent of today's truck loads are war loads.

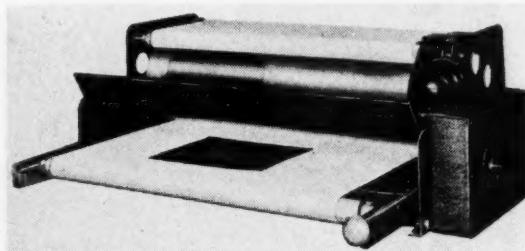
In addition to being one of the largest producers of military vehicles, GMC is also building many commercial trucks for essential users. If you are eligible for a new truck, your GMC dealer will gladly help you fill out an application. Remember, too, that GMC is headquarters for the original Preventive Maintenance Service. **INVEST IN VICTORY . . . BUY MORE WAR BONDS**

**GMC TRUCK & COACH DIVISION
GENERAL MOTORS**



HOME OF COMMERCIAL GMC TRUCKS AND GM COACHES . . .
VOLUME PRODUCER OF GMC ARMY TRUCKS AND AMPHIBIAN "DUCKS"

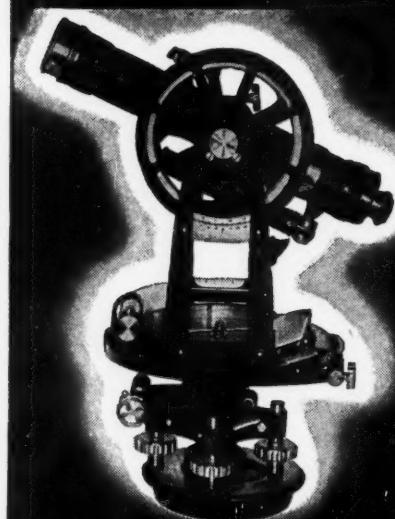
CONTINUOUS BLUEPRINT DRYER table-type, electrically heated model, is available in two sizes for "overall drying" of blueprints or black and white prints in 26-and 44-in. widths. In addition to standard heat regulation, dryers also are equipped with variable speed drive motors and controllers, permitting instantaneous speed changes over a range of 6 in. to 3 1/2 ft. a minute, thus accommodating all types of work under various drying conditions. Current consumption is small—on 26-in. dryer, 14 amp. on 110 v., 7 amp. on 220 v.; on 44-in. dryer, 23 amp. on 110 v., 12 amp. on 220 v. Features: (1) pressed steel framework—cannot warp from effects



of heat; (2) specially woven seamless band—no joints to deface prints; (3) heavy seamless copper revolving drum—may be chromium plated; (4) steel-clad, refractory insulated, Nichrome heaters, nickel contacts and asbestos insulated nickel wire used to form heating and control unit. 26-in. dryer 110-v., ac. or dc., is 40 in. long, 28 in. wide and 13 in. high; 44-in. dryer, 110 v., ac. or dc. is 58 in. long, 28 in. wide and 13 in. high. Both machines are complete, provided with receiving tray for dried prints.—**Peck and Harvey**, 4327 Addison St., Chicago 41, Ill.

Serving the Services is a HIGH HONOR
WHITE TRANSITS and LEVELS

are doing an outstanding job throughout the World



TYPE II U. S. ARMY TRANSIT

- ACCURACY • PRECISION
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Recommended for precise Municipal, Railroad, Highway and Bridge Work.

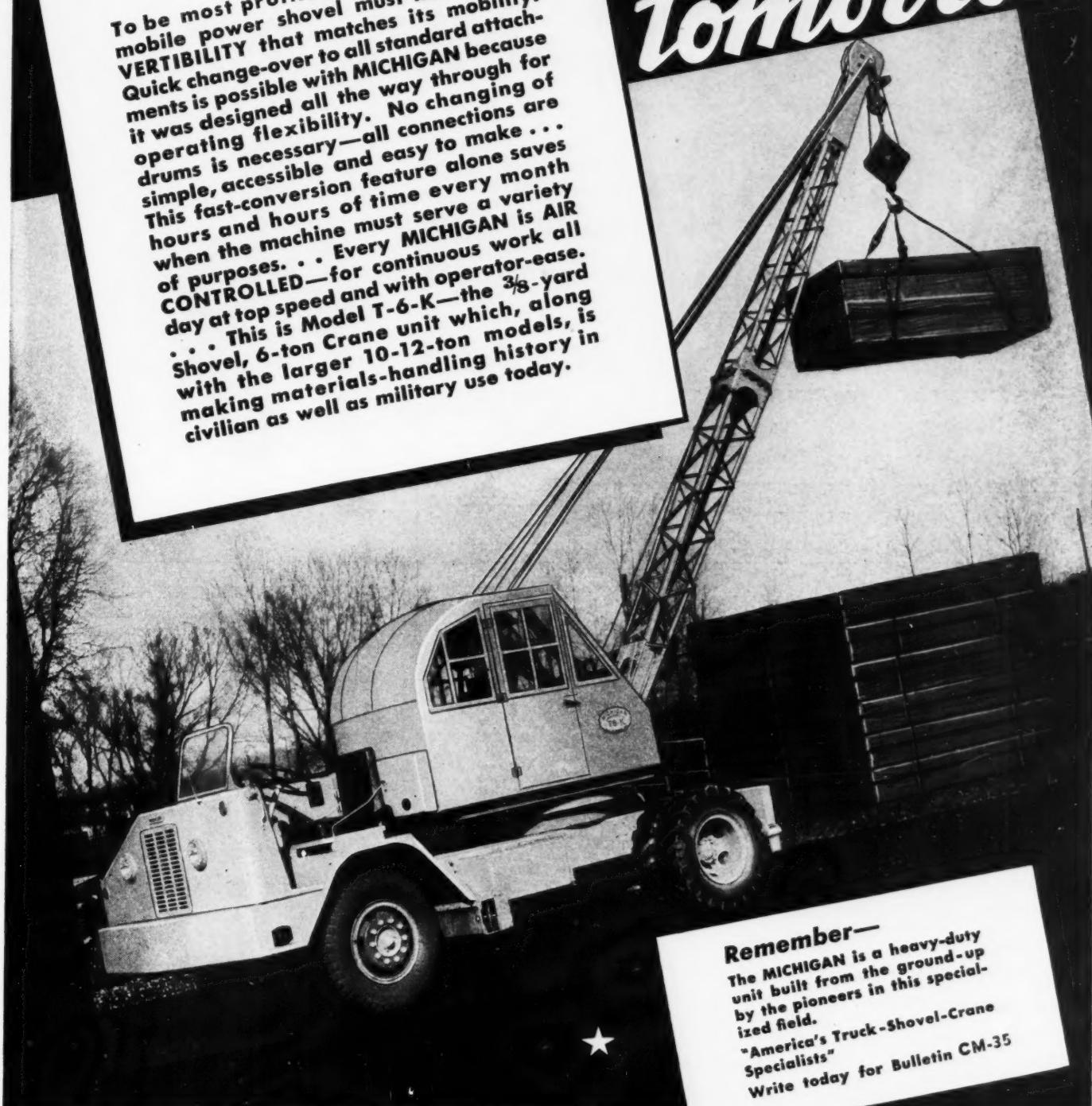
DAVID WHITE CO.

315 W. Court St. Milwaukee 12, Wis.

• Send for Bulletin 1039

Crane today - DRAGLINE, CLAM, SHOVEL OR HOE tomorrow

To be most profitable for its owner, a mobile power shovel must have CON- VERTIBILITY that matches its mobility. Quick change-over to all standard attachments is possible with MICHIGAN because it was designed all the way through for operating flexibility. No changing of drums is necessary—all connections are simple, accessible and easy to make . . . This fast-conversion feature alone saves hours and hours of time every month when the machine must serve a variety of purposes. . . Every MICHIGAN is AIR CONTROLLED—for continuous work all day at top speed and with operator-ease. . . This is Model T-6-K—the $\frac{3}{8}$ -yard Shovel, 6-ton Crane unit which, along with the larger 10-12-ton models, is making materials-handling history in civilian as well as military use today.



Remember—

The MICHIGAN is a heavy-duty unit built from the ground-up by the pioneers in this specialized field.

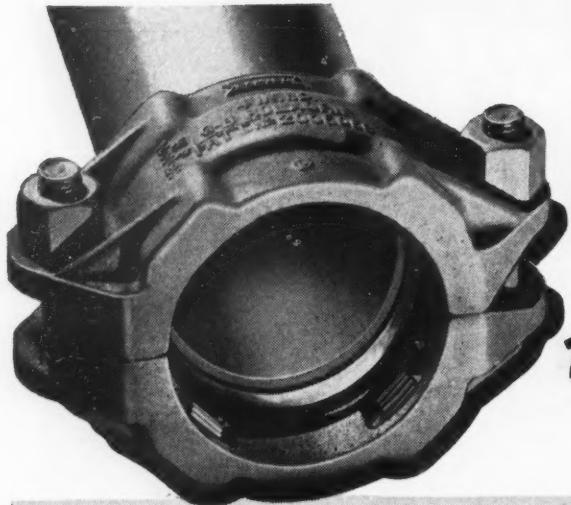
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MICHIGAN

POWER SHOVEL COMPANY

BENTON HARBOR, MICHIGAN



*Eliminate
Costly
Time-Wasting
Operations*

ROLAGRIP PIPE COUPLINGS

With PLAIN END Pipe for Leakproof Connections

With Rolagrips no part of the pipe is cut away by threading or grooving, leaving the machined surface exposed to corrosion. There is no danger of excessive weakening of the pipe wall from grooving. In fact, since no end preparation is required with Rolagrip Couplings, lighter weight pipe may be used at considerable savings in initial cost, freight, handling, maintenance.

NO SPECIAL TOOLS FOR INSTALLATION

Only three parts to position, two bolts to tighten for leak-proof connections. Odd lengths of pipe may be cut and coupled-in; a section of damaged pipe may be cut out and new section inserted and coupled with Rol-

grips. In addition, both coupling and pipe may be completely salvaged. Send for new Catalog showing installations, engineering data and complete information on pipe couplings and fittings.



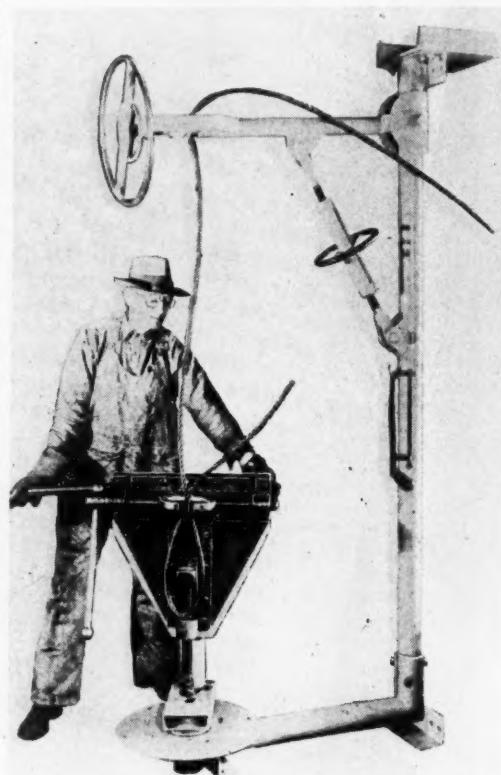
ESTABLISHED 1898

GUSTIN-BACON MANUFACTURING COMPANY
KANSAS CITY 7, MISSOURI

New York • Philadelphia • Chicago • Tulsa • Houston • Fort Worth • San Francisco



CABLE SPLICING RIG is self-contained unit designed to facilitate all necessary operations in splicing of cable. Any standard splicing vise may be attached to stand (1) which is supported by a ball-bearing revolving base (2). Directly above the splicing vise is a quick opening jaw-type vise (3) supported by a tension member (4). Gripping vise is actuated by spinning a large heavy rimmed wheel. Any desired tension is put on the cable



between the two vises by vertical adjustment of tension member through a double-acting screw provided by a hand wheel (5). Cable is easily untwisted for splicing by revolving splicing vise stand. For compactness in shipping and handling, top and bottom members of rig are detachable. Unit may be set up, bolted to column or post or lashed to a tree ready for operation in 10 min. Vertical or horizontal mounting is provided for by use of mounting pads (7). Overall size, set up, 96x45 in. Weight 250 lb. Increases speed and efficiency of splicing by reducing physical effort involved.—Garlinghouse Brothers, 2416 E. 16th St., Los Angeles 21, Calif.

★ ★ ★

WOOD PRESERVER named "Triple-A Copper Naphthenate" when applied by brush, spray or dipping, will deeply penetrate and impregnate wood, sealing it against destructive influences of dry rot, fungi and molds. Non-poisonous to humans and will not bleed through when light colored paints are applied over wood preserver. For use on wood sills, lumber, fence posts, on boat timbers or in wood in any location subjected to dry rot or disintegration. After applying, allow to dry for 48 hr. before applying other paints or coatings for decorative effects. When white paint is applied over copper primer, use two coats to seal thoroughly against bleed-through. One coat of darker colors will seal economically. Shipped in 1, 5, 30, and 55 gal. containers. One gallon will treat approximately 200 sq. ft. of surface.—Quigley Co., Inc., 527 Fifth Ave., New York 17, N. Y.

American

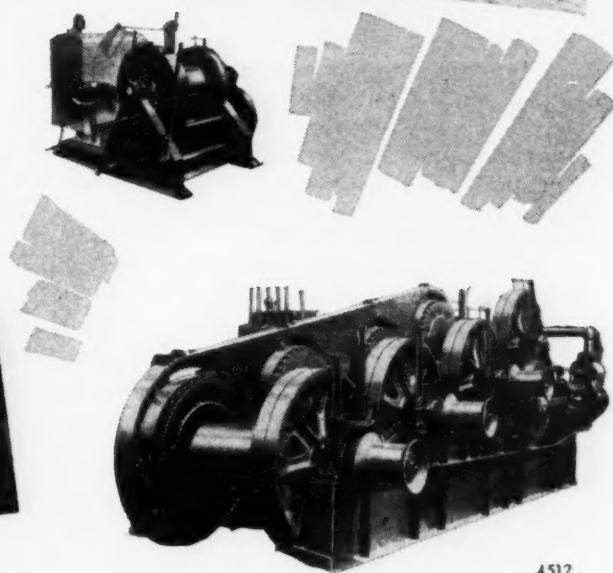
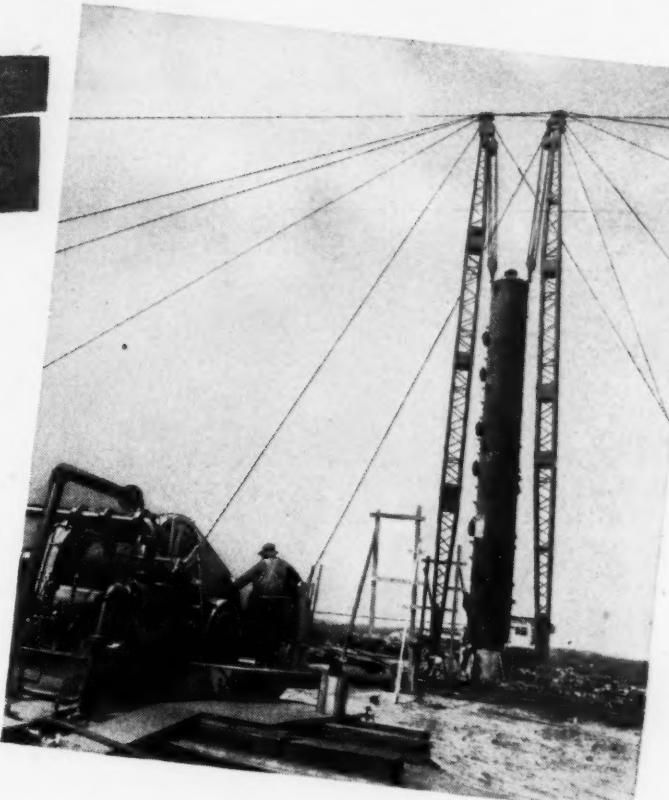
MATERIALS HANDLING FOR EVERY CONSTRUCTION JOB

HOISTS & DERRICKS

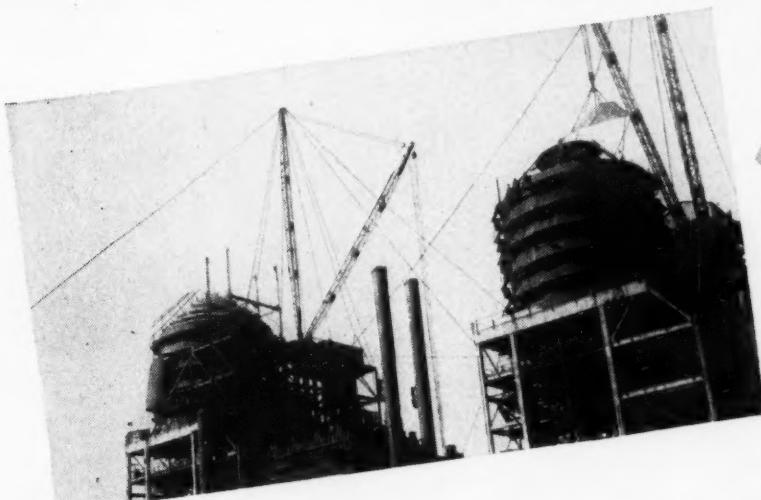
An AMERICAN Derrick with suitable hoist makes a versatile materials handling method on a wide variety of construction jobs. They can be set up and moved about easily. There is also combined lifting capacity and reach that contribute to speed and economy. Progressive contractors have learned the advantages of having one or more AMERICAN Derricks and Hoists.

Whatever your requirements, there is AMERICAN Equipment for you. In derricks there are the Guy, Stiffleg, Steel Erector's, Gin Poles, Gallows Frames, and special types of AMERICAN designed and built derricks with a choice in size, in length of boom, and in lifting capacity. In hoists the sizes range from the little single drum to the large multiple drum hoists for 250 ton derricks and larger.

Now is the time to look into your derrick requirements.



4512



Plan now... but wait for AMERICAN!

AMERICAN

AMERICAN HOIST & DERRICK CO.

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MATERIALS HANDLING
for EVERY INDUSTRY

NEW YORK

Wherever
wire rope is fastened
... use genuine
CROSBY CLIPS
with the Red-U-Bolt





GET INTO ACTION FASTER



WITH THE DAVEY AUTO-AIR

Whether it's breaking up a section of concrete, emergency welding, or doing more extensive construction work . . . this truck, equipped with the Davey-Auto-Air-Welding combination, assures fast transportation of crew, tools and materials . . . provides compressed air . . . furnishes electricity for welding . . . and all power is supplied by the truck's engine.

You can save manpower, time, space, maintenance, and original cost by converting one or more of your trucks this way. Select one of these three units—the Auto-Air Compressor; the Compressor and Welder; or the Compressor, Welder, and Lighting Generator Combination . . . have it mounted locally on your truck with the Davey Heavy-Duty Truck Power Take-Off installed in the drive-shaft of the truck.

Available in 60, 105, 160, 210 and 315 cu. ft. capacities Auto-Air and 200 or 300 amp. welding generators.

CONTRACTORS ARE MAKING THE DAVEY PNEUMATIC SAW STANDARD EQUIPMENT

For cribbing, shoring, piling, bulkheading operations—construction of bridges, dams, mines, roads, wharfs—felling and bucking trees.

Under or above water operations ★ straight-edge cuts ★ clamping device which supports weight of saw ★ performance in any weather ★ rugged construction for speed and long service ★ standard cross-cut teeth are easily sharpened.

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Write for a copy of the free Davey Catalog E-172, which gives full information on Davey Compressors, Davey Truck Power Take-Offs and Davey Pneumatic Saws, plus other engineering data.

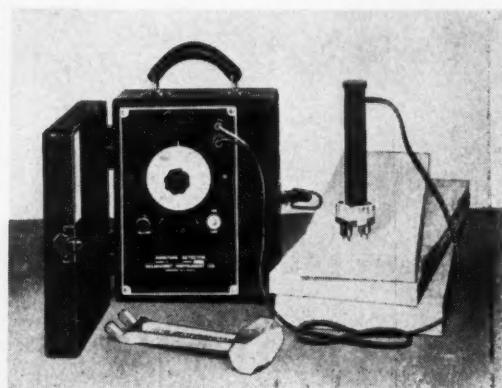
D-145-3

DAVEY Compressor Co.
KENT • OHIO

DEALERS IN PRINCIPAL CITIES



MOISTURE DETECTOR for measuring moisture content of lumber and wood products and various construction materials takes advantage of the latest ideas in electrical circuits and electronic principles, all of which have been simplified and combined in a practical meter which covers the



range of 7 to 25 percent moisture with an accuracy of plus or minus 1 percent. Complete and self-contained, unit is used by forcing the electrode needles into the material being tested and the reading then is taken by turning dial knob until a small light above the dial flashes at the correct moisture content. Operating on batteries, Delmhurst moisture detector may be used anywhere. Lightweight (6 lb.) makes carrying easy. Sturdily constructed for long, hard wear. Rugged case protects instrument.—Colloid Equipment Co., Inc. 50 Church St., New York 7, N. Y.

★ ★ ★

COATED FABRIC SPAT. giving same protection as rubber and having additional qualities of light weight and flexibility, provides ankle and foot protection against acids, alkalies, oils, solvents and greases. Three snap fasteners at the top and

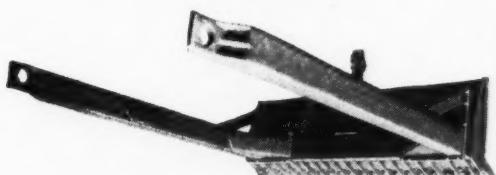


two at the bottom make the spat easy to put on and adjust and assure quick removal. An elastic strap fits under the instep. Large flare assures overall protection of instep. Trousers may be worn over spat or tucked inside.—American Optical Co., Southbridge, Mass.

YOU CAN MOVE



Worm's eye view of New Buckeye Bulldozer moldboard showing large number of heavy supporting ribs reinforcing push plate. Note also large moldboard ribs and sturdy boxbeam construction of push arms.



EVERY FEATURE is designed and built with one idea—to make it stand up under the toughest operating conditions with the minimum of lost time for maintenance and repairs. Simplicity of design, skillfully that more strength is packed into less weight. The push plate is reinforced by heavy supporting ribs. Large, closely spaced moldboard ribs make it strong and rigid enough to take the full power of the tractor on one corner without permanent deflection.

The new double trunnion mounting provides an improved method of adjusting the digging angle and tilting the moldboard. Accurate alignment and rigidity are maintained in any position. The overhead, single point suspension of the moldboard provides low drop, way below ground level, and high powerful lift for moving huge loads. Scientific curvature of the blade rolls the dirt ahead, requiring less horsepower and carrying a larger flow ahead of the board. Weight is evenly distributed to assure maximum pushing power. All this means larger loads, less power required, and lower operating and maintenance costs. Write for specifications.

BUCKEYE TRACTION DITCHER CO.
Findlay, Ohio



Built by **Buckeye** ✓

Buckeye Traction Ditcher Co., Findlay, Ohio



Convertible Shovels



Trenchers



Tractor Equipment



Road Wideners



R-B Finegraders



Spreaders

"FAVORITE"



Reversible Ratchet Wrench

Three sizes of handles, each handle takes five different heads: each head fits two different size nuts for all U.S. Standard bolts up to 1½".

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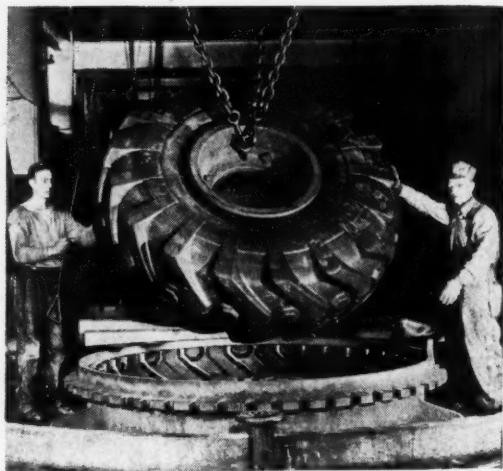
operates in narrow spaces . . . can be used over long studs . . . is instantly reversible . . . and has heads that fit two different sizes of nuts . . . that is what you get in a FAVORITE. Get a FAVORITE Wrench from your supply house, and see for yourself why users report 75% speedier nut-tightening operations . . . on assemblies . . . on machines . . . on pipe lines . . . on installation work . . . on plant and structure maintenance.

GREENE, TWEED & CO.

Bronx Blvd. at 238th St.

NEW YORK 66, N. Y.

OFF-THE-ROAD TIRES for earth and rock moving and logging equipment are now being manufactured, upon authorization of the government, with synthetic rubber and rayon using approximately 35 percent synthetic rubber and 65 percent natural rubber. Introduction of synthetic rubber content is



due to shortage of crude rubber. Use of rayon will provide greater resistance to bruising and offers greater service possibilities. Goodyear's line of Earth Mover, All-Weather, Sure Grip and Hard Rock Lug tires adapt themselves particularly well to synthetic rubber construction.—**Goodyear Tire and Rubber Co., Akron, Ohio.**

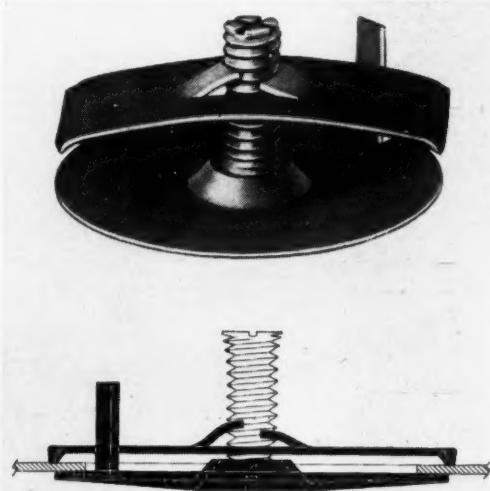
★ ★ ★

Clipper
MASONRY SAWS

A special shape or shorter length need only be as far away as your Clipper Masonry Saw. The basic feature of Clipper is the new multiple cutting principle . . . a method developed especially for Masonry Materials. You can be sure to cut with the fastest cutting speed and to obtain the longest blade life. Write for Catalog.

CLIPPER
MANUFACTURING CO.
4037 Manchester St. ST. LOUIS, MO.

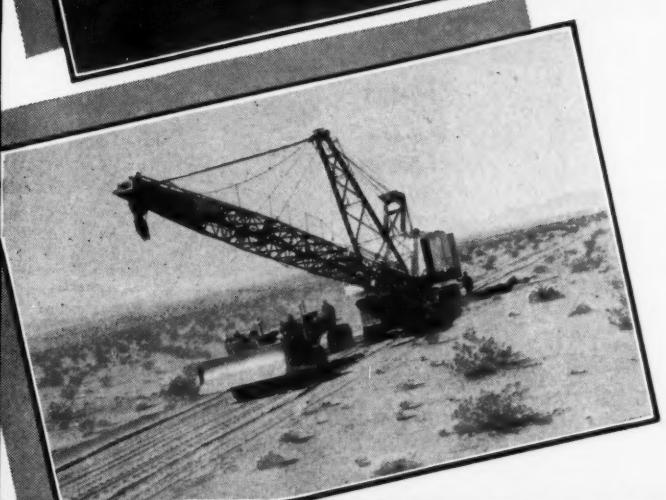
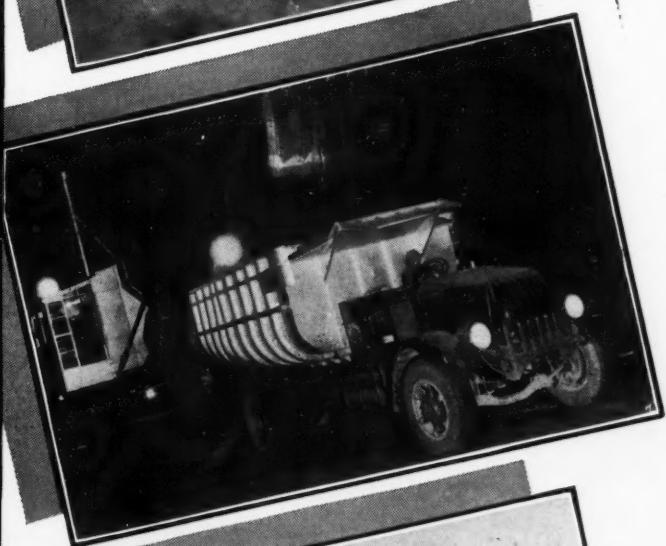
SPEED NUT COVER PLATES, originally designed for patching bullet holes in airplanes, are now used as removable covers for inspection doors, access holes and vent holes. They also are used to seal up holes left after alterations or removal of equipment. Easily and quickly attached from one



side by sliding one end of speed nut into hole centering the cover plate over the hole and tightening the screw. Turned-down tab on cover plate prevents speed nut from turning while the screw is tightened. To remove—loosen screw and slip speed nut out of hole. Made of SAE 1060 heat-treated steel, Parkerized and coated with zinc chromate primer. Three sizes now available to fit a wide range of panel thickness and to cover holes 29/32, 1 1/8 and 1 1/4 in. dia.—**Tinnerman Products, Inc., 2120 Fulton Rd., Cleveland 13, Ohio.**

It Takes

"TOUGH HARDNESS" TO WIN PRODUCTION BATTLES



- **HARD-FACING IS INDUSTRY'S BEST WEAPON** to combat abrasion, shock, and impact — the every day enemies of equipment parts subject to excessive wear.

- **WORN PARTS MEAN VALUABLE TIME LOST** while making repairs and replacements. The battle for increased production cannot be won during shut-down hours!

- **PROTECTING EQUIPMENT PARTS WITH MIR-O-COL'S** "tough hardness" is a guarantee of longer life wear, uninterrupted service, fewer replacements, and reduced operating losses. Mir-O-Col hard-facing rods, applied by acetylene or electric welding process, will outwear steel many times, because they are scientifically alloyed to resist abrasion, corrosion, impact and high frictional heat.

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MIR-O-COL HARD FACING HAS "TOUGH HARDNESS"

SISALKRAFT



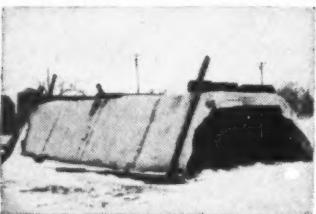
SISAL REINFORCEMENT GIVES STRENGTH AND TEAR RESISTANCE



PROTECTING SOIL CEMENT



PROTECTING ROAD MIX



PROTECTS MATERIALS STORED IN THE OPEN

LOW-COST PROTECTION On ALL Road Jobs!

UNMATCHED in their ability to hold moisture within the slab, SISALKRAFT Road Blankets have a time-proven record as the Number One concrete curing agent — producing denser, longer lasting concrete roads at low cost.

Savings in time, manpower and money are effected by the speed with which two men apply SISALKRAFT Blankets over the slab. No sprinkling — no burlap — just "let 'em lay." The concrete cures automatically! The slab is protected from weather and dirt! The blankets are used again and again.

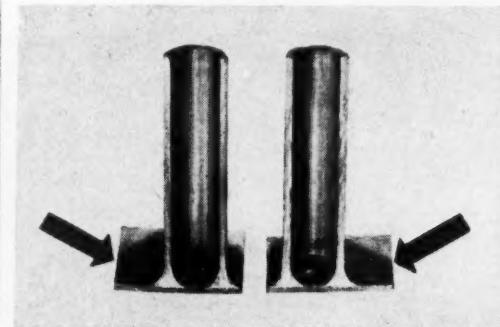
Protect soil cement, road mix, materials and equipment with SISALKRAFT. It's tough, weatherproof, scuffproof, tear-resistant!

As vital war needs decrease, more and more SISALKRAFT will be available for your use. Victory comes first — and that's the way you want it, we're sure.

Manufacturers of
SISALKRAFT, FIBREEN,
SISAL-X, SISALTAPE AND
COPPER-ARMORED SISALKRAFT

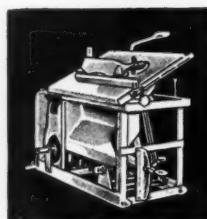


FREE-FLOWING SOLDER, labelled EutecRod 199, which is said to flow on aluminum as readily as ordinary lead tin solder on tin plate, brass or copper now permits satisfactory sealing of joints when sheet aluminum is lock-seamed, or lapped and spot-welded or riveted. In long laps it will make joints of moderate strength, but makers recommend



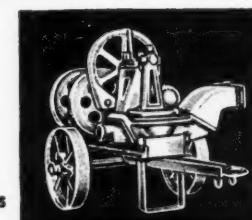
it for a seal. Rod will work on cast as well as on wrought aluminum and on steel, copper and nickel alloys. Suitable for application where completed joint will be heated over boiling point of water (212 deg. F.) under working conditions. Its low temperature of application, 400 deg. F. makes it possible to join thin sheet metal without danger of distortion. EutecRod 199 will even bond to cast iron, if this product has first been "tinned" with a zinc-base solder. Available in $\frac{1}{8}$ -in. size in standard packages of 200, 100, 50 or 25 lb.—Eutetic Welding Alloys Co., 40 Worth St., New York 13, N. Y.

C.H.&E.



SAW RIGS

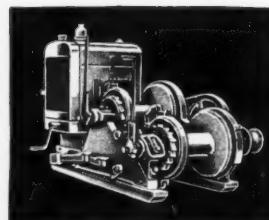
4 sizes—ripping capacity 2" to 6" lumber gasoline engine or motor drive.



PUMPS

Diaphragm,
Self-Priming
Centrifugal
Piston &
Jetting Pumps

Also
3-TON
ROAD
ROLLER



HOISTS

5 sizes—from 800# to 7000# lifting capacity—gasoline engine or motor drive.

Write for catalog

C. H. & E. Manufacturing Co.
3847 No. Palmer St. Milwaukee 12, Wis.



What makes this
Upson-Walton Wood Block
a Better Wood Block?

THE wood block is the earliest form of tackle pulley-block. Centuries old, made originally with rope straps, then with iron and finally with steel, it became a more efficient, sturdier hoisting tool as time progressed—until today, in Upson-Walton wood blocks, we have hoisting strength undreamed of by its early users.

UPSON-WALTON SHELLS ARE BEST QUALITY HARD WOOD specially chosen for strength. Wood is well seasoned, free from knots and hearts which would weaken it. This shell is unusually hard wearing and long lasting.

SHEAVES ARE MADE FROM CLOSE-GRAINED GREY IRON, hence they are stronger. Closely inspected to exclude all blow-holes, pits and other weakening inclusions.

SHEAVE RIM AND CENTER PIN ARE CONCENTRIC. Center pins are made of cold rolled steel. Unusual care is taken by Upson-Walton to insure true-running sheaves. Close

tolerance between sheave bearing and center pin results in longer life for the bearing.

HEAVY STRAPS AND DROP FORGED CONNECTIONS of selected fine grain steel give Upson-Walton wood blocks greater strength and a higher safety factor.

HEAVIER DROP-FORGED HOIST HOOKS . . . not the usual and weaker round stock type, but specially-designed, heavy-duty hoist type as used on cranes and heavy equipment. Permits greatly increased safe-working loads. Majority of Upson-Walton wood blocks are now equipped with this type hook.

ALL UPSON-WALTON WOOD BLOCKS ARE FURNISHED COMPLETE WITH BECKET



Established 1871

THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope. Wire Rope Fittings. Tackle Blocks

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SPECIFIC JOB
REPUBLIC HOSE IS

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THROUGH Republic Research and technological advance in processing man-made rubber, Republic Hose is now "better than before." Construction engineering and contracting uses have been studied and today's products have been designed and built for specific services.

Your nearby Republic Distributor is equipped to supply high quality air, water, suction, sand suction, jetting, street washing, contractor's road hose, dredge sleeves, and other items.



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LEE DELUXE TIRES AND TUBES
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STERLINGS EXCEL!**



Your Past War Plans
Should Call for High
Quality Wheelbarrows

Carefully examine every detail of a Sterling Wheelbarrow — tray, braces, wheel, wheel guard, legs and handles. You'll find that Sterlings are engineered and built to take hard punishment over a long period of years. Right now, 100% of our facilities is devoted to essential war production. But we are looking forward to the postwar era when we can again take care of your normal barrow requirements.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Sterling
WHEELBARROWS

Look for this Mark of
STERLING Quality

TWO NEW OUTDOOR AC. WELDERS, 500- and 300-amp. types, having current ranges from 100 to 625 and 60 to 375 amp. respectively, are designed for use in shipyards and similar outdoor locations where exposure to the weather is common. Equipped with "idlematic" control which functions to reduce output voltage automatically



to less than 30 v. whenever arc is not in operation, yet provides full power for welding directly arc is struck. In addition this control is provided with a switch, operated by a handle projecting through top of case, for shutting off welder when not in use. Protection against rain, snow and sleet is provided by drip-proof construction of all openings in top of welder inclosures and by sealed window over current indicator. Ventilating openings serve both to shed water and to keep air velocity low. Special finish of all internal parts provides protection against corrosion from moist air. Other features: built-in power factor improvement, fingertip adjustment, stepless current control and fan-forced ventilation.—General Electric Co., Schenectady, N. Y.



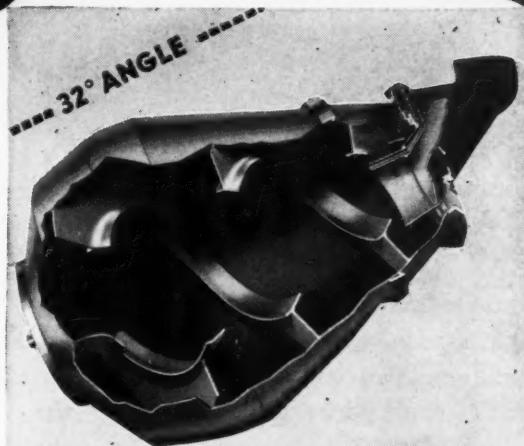
SYNTHETIC RUBBER ADHESIVES are now available for purposes served by natural rubber cements in the same field. One is for general utility use and will adhere to almost any clean surface. Synthetic cements are available for heat vulcanization, air curing or cold adhesions. Compounded synthetic cements, suitable for fabric, leather and synthetic adhesions, have a non-toxic solvent and will provide a satisfactory bond with a variety of materials. For metal adhesion, two special cements have been developed, one for use with vulcanized Neoprene when it is bonded to porcelain, metal and like materials, and the other for use with uncured Neoprene for the same purpose. Major military products on which these cements have had successful use include life-saving boats, rubber mattresses, belts, target tubes, tank crash pads, pontons, tank linings, land mines, brake tubes, balloons, diving suits and use in submarines.—The B. F. Goodrich Co., Akron, Ohio.



● Smith-Mobile Truck Mixer provides a fast, controlled discharge even when the machine is on a steep incline. The patented T-shaped blades scoop up the thoroughly mixed concrete and carry it swiftly to the discharge opening, without segregation. The speed of the drum controls the speed of discharge and a smooth steady flow results, even on an up-grade.

Smith was the FIRST truck mixer manufacturer to introduce a HIGH DISCHARGE model, eliminating the need for a rear-end hoist with its original extra cost, dead load and maintenance expense. And Smith-Mobile pioneered many other time-tested truck mixer features. It will pay you to investigate. Write today for Catalog No. 198-C.

The T. L. SMITH CO., 2851 N. 32nd St., Milwaukee 10, Wis.



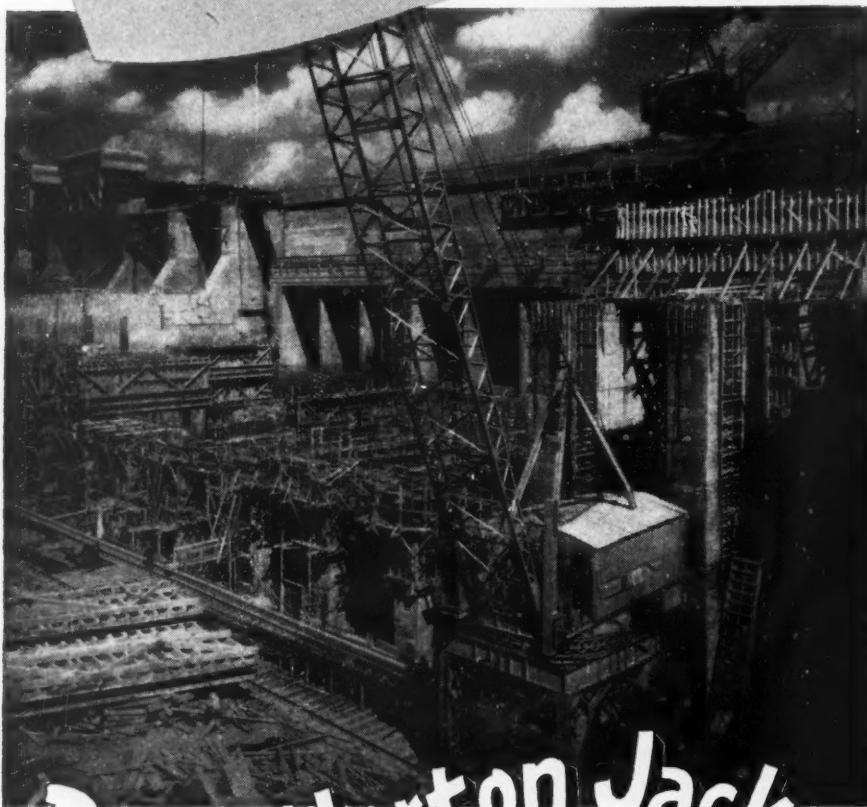
The illustration above shows a No. 4 Smith-Mobile, one of a fleet operated by Western Concrete and Equipment Company and used in the construction of a Southern California war plant. This Smith-Mobile is discharging concrete into a high floor hopper. The ramp is a 14° grade and the axis of the mixer drum is 18° from horizontal — yet the speed of discharge is NOT seriously affected by this steep incline.

SMITH-MOBILE

The ORIGINAL HIGH DISCHARGE Truck Mixer and Agitator

*Built for the special requirements
of engineering construction-*

Ewing Galloway



Duff-Norton Jacks

It takes husky, powerful equipment to stand up under the severe requirements of construction work. Duff-Norton Jacks are built to take it. Strong and dependable, they give you long service life

under the toughest kind of conditions. There is a type and size for every requirement. Write for the Duff-Norton catalog giving specifications and descriptions of the complete Duff-Norton line.

Your industrial distributor handles Duff-Norton Jacks.

The Duff-Norton Manufacturing Co.
PITTSBURGH, PA.

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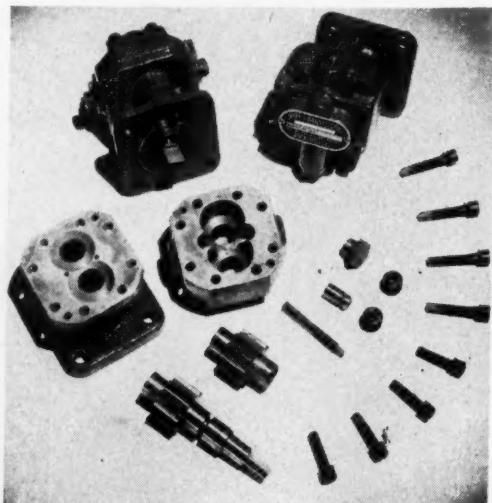
Representatives in Principal Cities

LARGE and SMALL DUFF-NORTON JACKS SERVE CONSTRUCTION . . .

From the time-saving Duff-Norton Trench Braces to the large, husky, heavy-duty screw jacks, Duff-Nortons are doing essential jobs on construction projects everywhere.



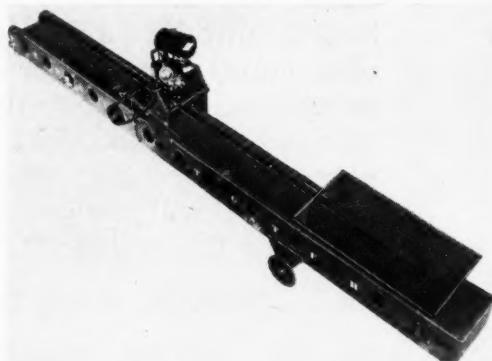
LOW-PRESSURE ROTARY PUMP for handling all types of liquids having lubricating qualities is especially adapted for use as a lubricating booster pump for oil lines, a gasoline dispensing pump and for oil pressure systems on automotive, truck or tractor equipment. Capacity of pump ranges from 1 gpm. at 600 rpm. to 4 gpm. at 2,400 rpm. Outstanding feature: spur gear tooth form claimed to eliminate excessive sliding and to reduce slip-



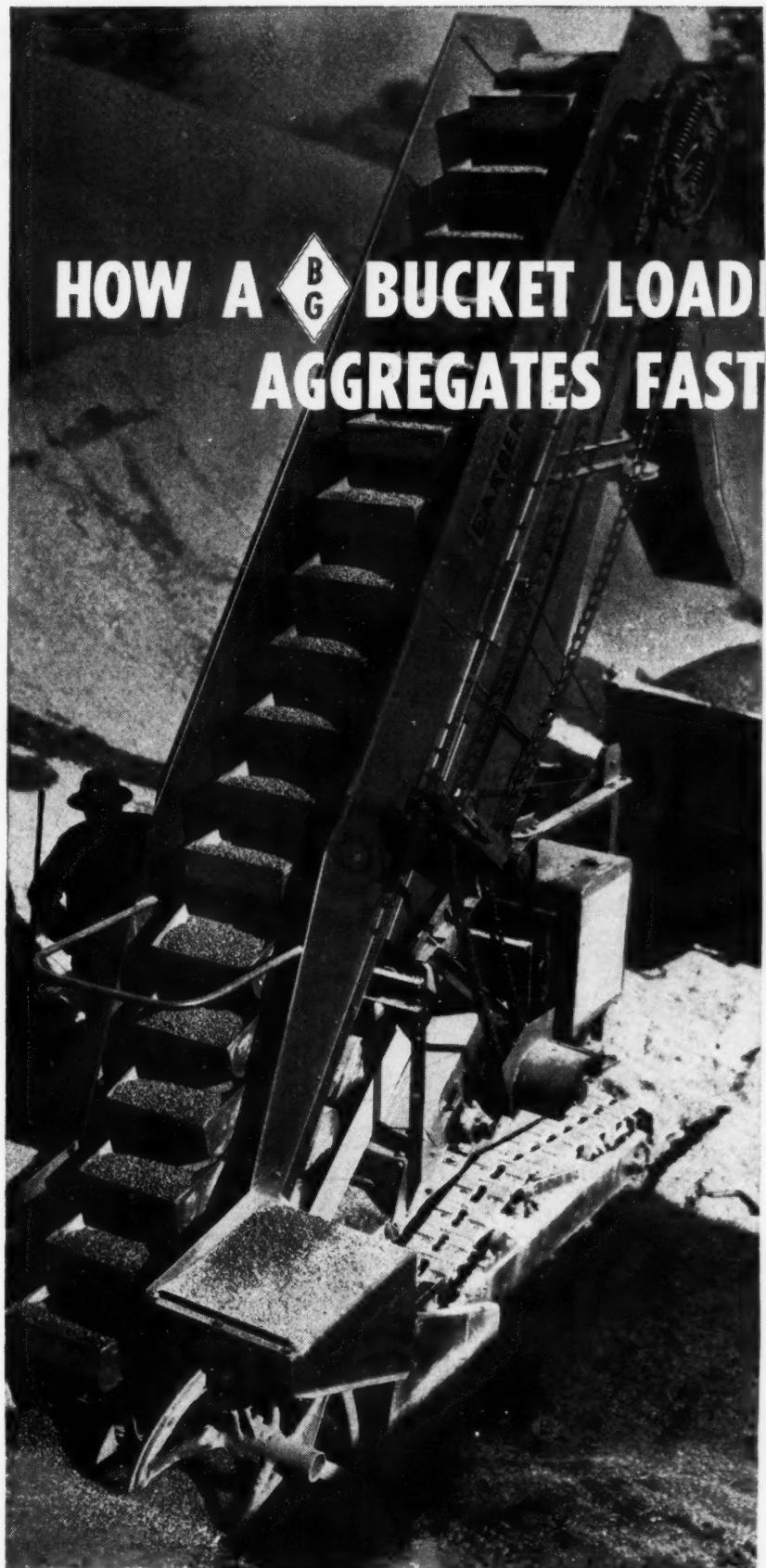
page of fluid to minimum; each tooth completely fills mating space as gears mesh and perfect sealing action is effected. Thus positive displacement of fluid is assured despite variation in fluid viscosity or other factors. Self-priming is another feature of pump and all parts are self-lubricated. Maximum pressure range on pump is 200 lb. per sq. in. and tests show that vacuum to 26-in. mercury gage is feasible. Weight 3½ lb.—John S. Barnes Corp., Rockford, Ill.

* * *

ALL-PURPOSE CONVEYOR called "Tote-All," lightweight, portable endless belt-type conveyor, is available in two lengths, 13 ft. 9 in. and 20 ft. and is recommended by its manufacturers for handling sand, gravel and brick on construction jobs. Equipped with a 1½-hp. gasoline engine for ordi-



nary work or with a 2.3 hp. engine for heavy-duty assignments. Or it may be purchased without power unit if user has own motor. Engine mounting on models equipped with gasoline engine is adjustable to keep engine level regardless of angle of conveyor. Normal belt speed, 420 fpm. Variable speed drive pulley is available, if desired.—Coaltoter Conveyor Co., 310 S. Michigan Ave., Chicago 4, Ill.



HOW A BUCKET LOADER HELPS HANDLE AGGREGATES FASTER AND CHEAPER

THIS versatile Barber-Greene Bucket Loader is a valuable job-coordinating unit in pit and quarry.

You can save money by processing aggregate at a uniform rate, even during "off" seasons, and storing it in stockpiles.

A Barber-Greene will reload it into trucks, whenever needed, at exceptionally low cost. In fact, many operators have found that the saving in truck time alone justifies its purchase.

Continuous handling by the B-G Loader is extremely advantageous in feeding material to processing equipment — screens, crushers, belt conveyors.

The B-G Bucket Loader also can be used for stripping, light excavating, screening, and many other cost-saving applications.

Full crawler mounting, tank type chassis, automatic overload release, synchronized spiral feeding, floating boom, centralized control, and 12 crowding speeds are but a few of the advanced mechanical features that give the B-G Loader long life and fine performance under the rigors of heavy, steady work. Consult your B-G representative or write the Barber-Greene Company, Aurora, Illinois.

44-28

Barber-Greene  *Constant Flow Equipment*



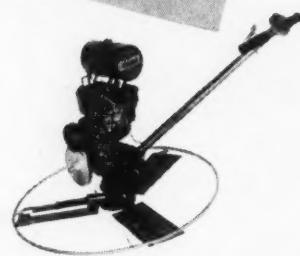
**NEW! LIGHTER!
FAST! LOW COST!**

WHITEMAN

Model "J" CONCRETE FINISHING MACHINE

For concrete floating and finishing on small jobs, such as Housing Projects. Gives small contractor big operator's machine economies. Trowel only 34" dia. Weighs only 105 lbs. Start floating earlier . . . Cut slab finishing time. Eliminate back-breaking labor of hand finishing. Low cost—everyone can afford it.

Write or wire for nearest distributor.



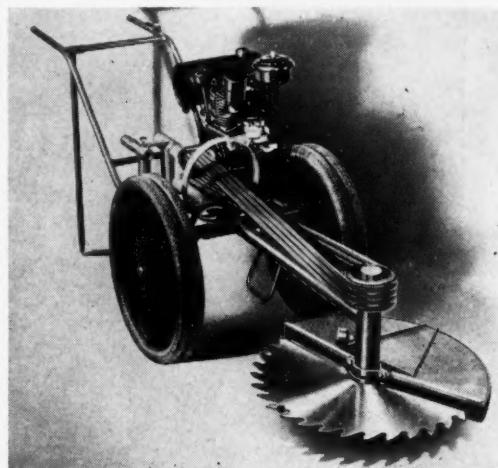
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1,000 sq. ft. in 15 min.**

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3249 Casitas Avenue

Los Angeles 26, California

PORTABLE SAW equipped with heavy-duty pneumatic tires (if desired) has constant centered drive which insures belt alignment no matter what the angle of operation. Operates with equal smoothness at any angle on or off ground. Four 112-in. V-belts connect two constant centered drive pul-



leys. Powered by 6-hp. air-cooled engine. Frame of tubular welded steel. Saw mandrel equipped with Timken roller bearings and grease seals. Wheels are 26-in. disk type and have needle bearings. Thirty-inch blade with extra large teeth and deep gullets minimizes file and upkeep. Saw speed is 1,150 rpm. Manufacturer claims that this saw will cut through a 24-in. hardwood tree in less than 3 min. and through 11 in. of spruce in 7 sec.—**Harry A. Lowther Co., 141 W. Jackson Blvd., Chicago, Ill.**

* * *

MEDIUM WEIGHT HEATING TORCH is especially designed for concentrated localized heating such as that required for bending, straightening and shrinking of steel plate as well as for silver brazing of heavy copper-plate in manufacture of cop-

Stop **WINTER LAG***
IN CONCRETE

Winter Lag* is the progressively slower action of concrete in acquiring strength as the thermometer goes down. Much of this Winter Lag* in concrete can be overcome by using calcium chloride in-the-mix. For instance, concrete containing 2% calcium chloride, exposed to 40° temperature, will acquire safe strength in practically the same time that plain concrete does at 70°. Used with other normal protection, concrete can be placed on favorable schedules all the year 'round. This is the least expensive as well as the most effective means of speeding up cold weather concrete schedules.

Besides the high early strength induced by calcium chloride you get built-in curing—automatic curing at no extra cost and you get higher strength *at all ages*.

Ask for our Bulletin 28, "Early Strength Concrete."

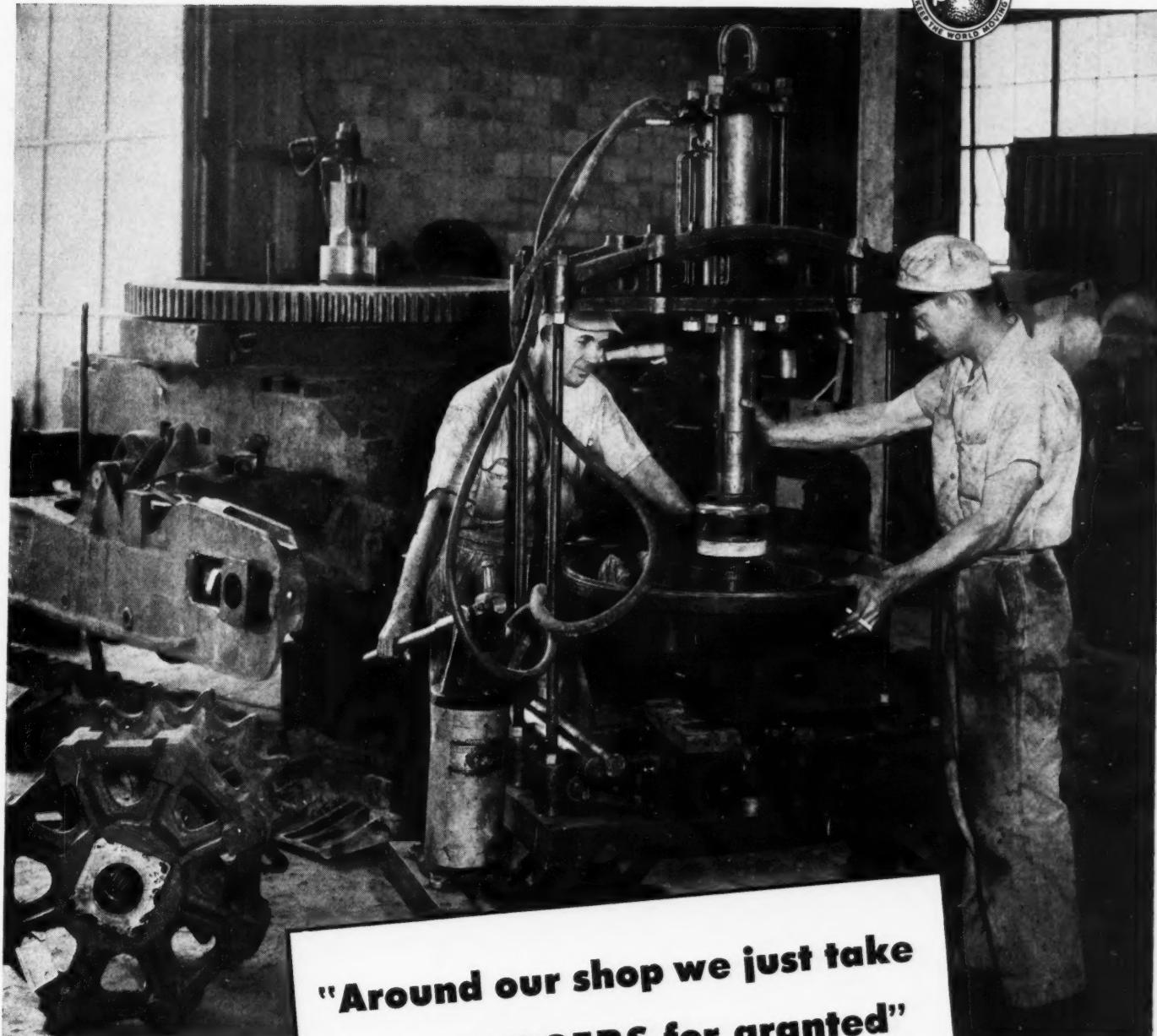
CALCIUM CHLORIDE ASSOCIATION
4145 Penobscot Building • Detroit 26, Michigan

CALCIUM CHLORIDE

SPEEDS WINTER CONCRETE CONSTRUCTION



per pipe. Five multi-flame acetylene heating tips as well as two multi-flame propane heating tips are available for use with this torch to meet the requirements of heavy heating jobs. Three mixers are available: for positive pressure acetylene, low pressure acetylene and propane. Available extensions include a 12-in. straight extension and 18-, 24- and 42-in. extensions.—**Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.**



"Around our shop we just take
the **RODGERS** for granted"

Pressing bushing into drum—
photo courtesy Choctaw, Inc.,
Memphis

"For five years now our Rodgers Universal Press has been proving that it has the stuff. We've strained this unit to the extreme, away beyond its intended capacity. It's so adaptable that we've even used it in production welding, when the job called for pressure on a jig. We'd be lost without it."

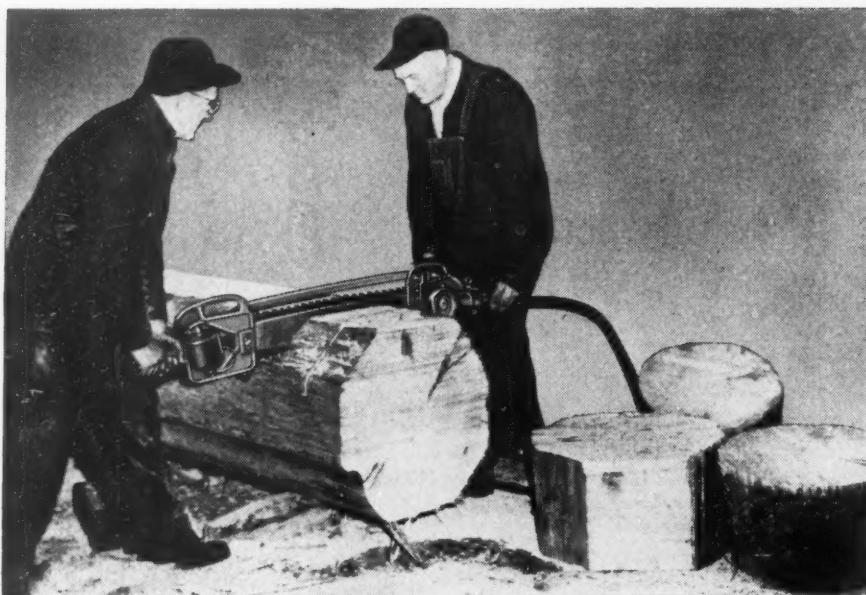
That's how James L. Nellis, vice president, Choctaw, Inc., Memphis, feels about the Rodgers Universal Press. It saves time and money, wherever portable

pulling, pressing, or lifting power is needed. If it's a Rodgers, it's the best in hydraulics. 4 sizes—one for your job. For complete information and prices, write or wire Rodgers Hydraulic, Inc., 7403 Walker Street, St. Louis Park, Minneapolis 16, Minnesota.

Uses for the RODGERS UNIVERSAL HYDRAULIC PRESS

Gear Pulling • General Press Work • Jacking Pipe • Erecting
Machinery • Relocating Machinery • All-Purpose Jack

RODGERS HYDRAULIC, Inc.



Cutting an octagonal boom of 24 inch Oregon fir, after having made longitudinal slab cuts.

A 42 LB. BABY THAT DOES THE WORK OF 10 MEN

For construction that involves heavy cutting, for cleaning roads or any work in sawing or felling trees or heavy timbers, the new Lombard air-driven chain saw is the baby that does the job of ten men.

Weighing only 42 pounds — 10% less than other makes — this husky air-driven, 24 inch tool goes through soft wood at an average of about an inch a second — hard wood in about double this time. Cuts a clean even track. Operates from a standard 105 cu. ft. compressor.

Also available in 3 h. p., 60 cycle, 220 volt, 24 inch and 36 inch cutting blades. Write for literature.



*New Easily Detachable Helper's End
with One-Shot Lubrication*



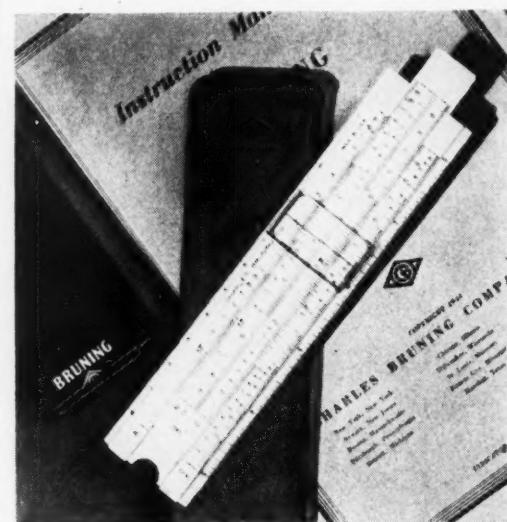
*New Quick-Change
Interlocking Chain*



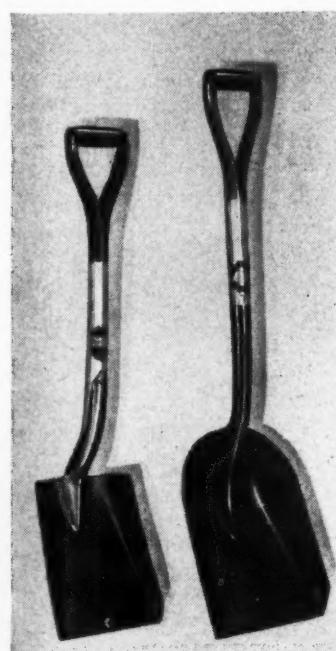
Dealer Opportunities in Some Areas

LOMBARD
GOVERNOR CORPORATION
ASHLAND, MASSACHUSETTS

5-IN. POCKET SLIDE RULE is said to fill need for high-precision, high-quality product which could be offered to engineers at a moderate price. Notable feature, precision of its graduations which are molded in and will not lose visibility through use. Graduations and numerals of the CI scale are in red to facilitate reading. Three screws in back



of rule provide simple adjustment for tension on slide. Glass indicator, easily replaceable in event of breakage, is inclosed in stainless steel frame which holds it firmly in place. A, B, CI, C, D, K, S, L and T scales are shown on rule for widest possible range of service. Beveled edges of rule are in graduated scales of both inches and centimeters.—Charles Bruning Co., 4700 W. Montrose Ave., Chicago, Ill.

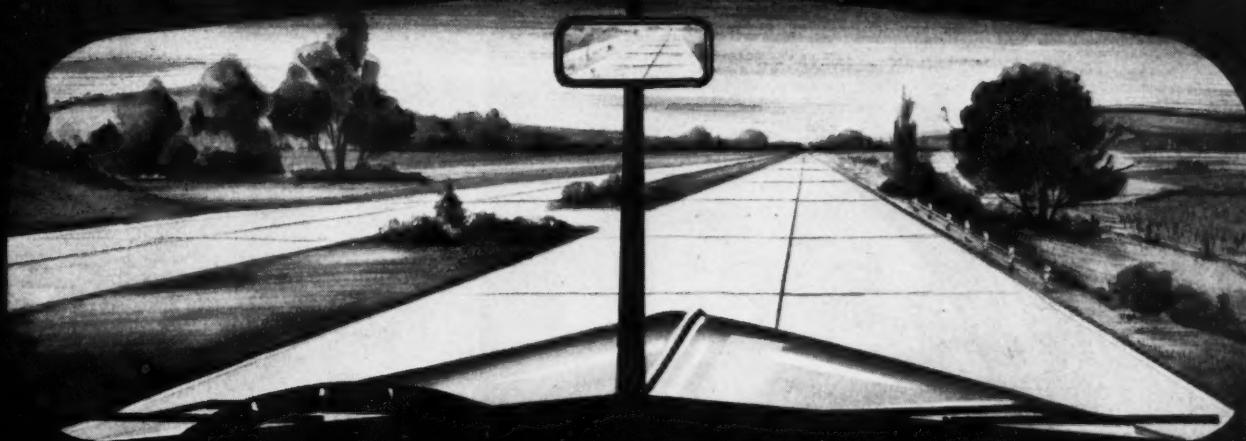


BLADE EDGES
GUARANTEED SPLIT - PROOF

INGERSOLL SHOVELS
"The Borg-Warner Line"

Write for Catalog and Prices
INGERSOLL STEEL & DISC DIVISION
BORG-WARNER CORPORATION
New Castle, Indiana
Plants: New Castle, Ind.; Chicago, Ill.; Kalamazoo, Mich.

MULCH TO IMPROVE ROADSIDES



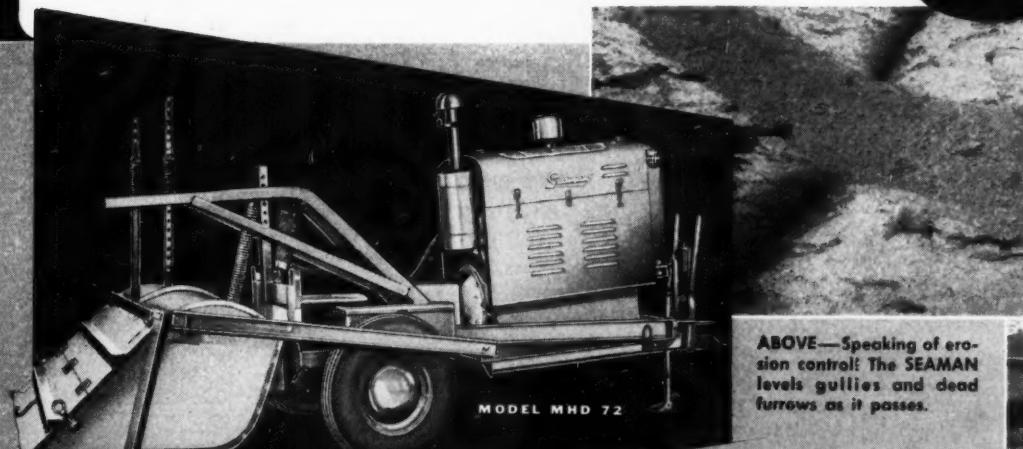
WITH THE SEAMAN PULVI MIXER

Interest has become widespread in new techniques to improve planting on highway shoulders and slopes. Development in these procedures has ranged from the use of a mulch, — without seeding, — simply to prevent erosion, — to preparation for elaborate landscaped lawns and planting on the entire boulevard or parkway right of way. Mulching, — the mixing of straw, grass hay, peat moss or leaf mold with the top several inches of soil, has a great number of practical advantages. It helps to prevent heavy rains from "sealing" soil and causing heavy water runoff. It reduces winter freezing, thawing and heaving. Mulching increases soil absorption of water and reduces loss by evaporation. And mulching improves soil structure and its plant nutrient qualities.

The SEAMAN PULVI-MIXER is an ideal implement for mulch preparation. With no other tool can straw or other mulching material be so uniformly and completely chopped, milled and mixed with soil, — and with no other tool can depth of treatment be so perfectly controlled. Soil which has been tilled with the SEAMAN, even without benefit of mulching, greatly aids in preventing erosion. When SEAMAN tillage is combined with mulch treatment, not only is shoulder and slope erosion completely checked but the perfectly pulverized seed-bed furthers nitrogen availability — and greatly increases the percentage of seed germination in the subsequent planting.

Another use for your SEAMAN! Further information gladly supplied.

For mulching, for seed-bed preparation and for root and brush removal in land clearance, SEAMAN offers a rotor assembly in which a shock-compensating device permits any one or more rows of tines to stop momentarily when a rock or large root is encountered. This feature prevents tine breakage. The tines resume rotation the instant the obstacle is passed. This rotor construction, designated as "Rotor Assembly C" is the same in the shock-compensating principle as the rotor designed especially for removal or leveling of ice and frozen drifts from runways and highways. The tine, however is of different design.



ABOVE—Speaking of erosion control: The SEAMAN levels gullies and dead furrows as it passes.



RIGHT—Mulching with the SEAMAN on a parkway development.

You are welcome to a copy of "Soil Stabilization Methods" — a modern, comprehensive description compiled by SEAMAN Engineers. Ask for Bulletin C-24.

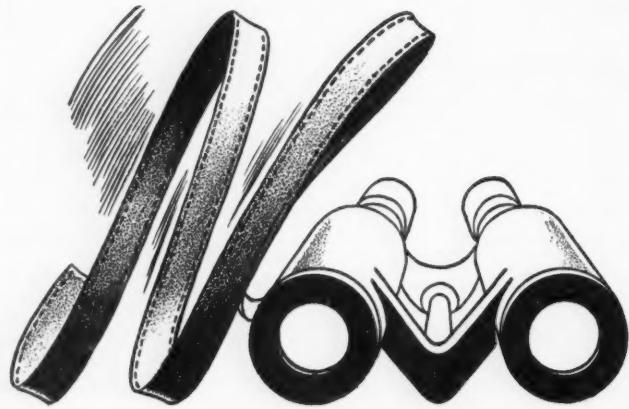


PIONEERED
by
Seaman

SEAMAN MOTORS
MILWAUKEE 3, WISCONSIN

ACKNOWLEDGED AS THE MOST EFFICIENT TRAVEL PLANT EVER BUILT!

LOOK TO THE FUTURE



"The future belongs to those who prepare for it" is good advice in any business. Postwar Construction is figured in the BILLIONS! It is BIG BUSINESS and it needs BIG PLANNING!

Your future in the Construction Field depends on your present preparation. You'll need money-saving Equipment for money-making jobs! Novo Engine, Pumps, Hoists, and Generator-Sets have proven themselves by past performance. Novo's future Line of Construction Equipment will be geared to the postwar jobs!

To be a successful Contractor, LOOK TO THE FUTURE... for successful Construction Equipment, LOOK TO NOVO!



Associate Member of A.E.D.

NOVO ENGINE CO.



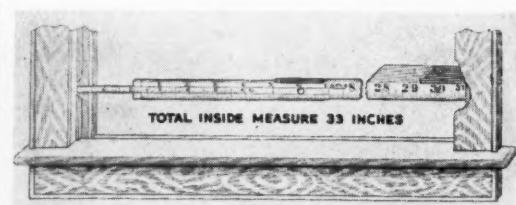
FACE SHIELDS designed to provide maximum of comfort for wearer and retaining the main characteristic of all B&C face shields, complete interchangeability of parts, are available in four models, each of them identified by variance in design of headgear. Each model has three different thicknesses and three different sizes of cellulose acetate



general purpose windows, three different sizes of 24-mesh screen windows for heat protection and a fiber front for scarifying and welding. Back head band is worn low on head and is completely adjustable to any size of head in either elastic or all-fiber headbands. Weight of shields is evenly distributed over entire headgear, eliminating sense of burden or unbalance no matter how long shield is worn. Is said to have full-floating suspension.—Boyer Campbell Co., 6540 St. Antoine St., Detroit 2, Mich.



6-FT. SPRING JOINT EXTENSION RULE suitable for general work, also for taking inside measurements of door, window and other openings has a 6-in. graduated brass slide fitted into one of the end sections. This slide runs under friction in a T slot and has a stop at each end so it cannot fall



out. Made of selected hardwood in boxwood finish, and is of uniform light color, making black markings easy to read. Equipped with strike plates (small brass plate both sides of each section) which prevent wear on markings in opening and closing. Lock joints reduce end play and aid in maintaining accuracy. Brass capped ends.—The Lufkin Rule Co., Saginaw, Mich.



There's
been a
Big Change

★ Yesterday's picks and shovels have given way to modern earth-moving giants. Yesterday's conventional tapered roller bearings have bowed to Tyson—the bearings with 30% more load-carrying rollers around the raceway.

More rollers mean extra capacity . . . longer

bearing life . . . more dependable performance on every heavy-duty job.

Today, this rugged Tyson "All-Rolls" bearing is proving its superiority in industry, transportation and agriculture. Use Tyson. You'll go farther.



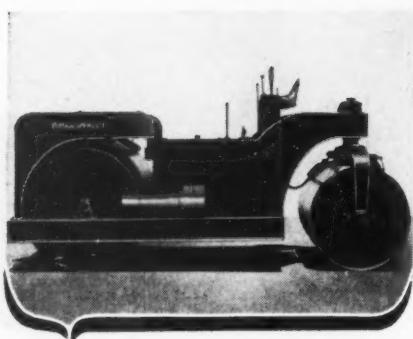
TYSON BEARING CORPORATION • MASSILLON, OHIO

COUNT THE ROLLS • THE ROLLS COUNT



Tyson
TODAY'S HEAVY-DUTY BEARING

★ BUY MORE WAR BONDS ★



you always see more
Buffalo-Springfield
Rollers
on resurfacing jobs

THE TRANSVERSE MOUNTING of the engine and simple, bevel gear drive provide such smoothness in reversing and freedom from vibration that they are ideal for finishing bituminous surfaces. Large, wide rolls combine high compression with large capacity. Watch Buffalo - Springfield Tandem Rollers, talk to their owners and you'll see why they are preferred by the road building industry. In addition to tandem rollers from 2 to 21 tons, the line of Buffalo-Springfield rollers includes three-wheel rollers from 6 to 12 tons, 3-axle tandems from 9 to 17 tons and trench rollers for widening work.

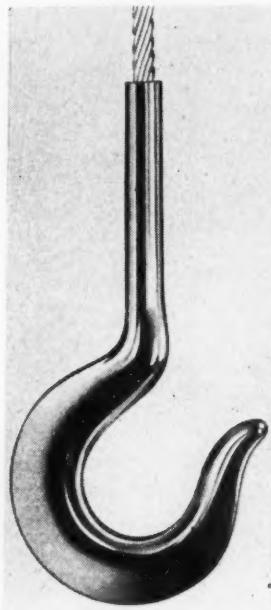


**THE
BUFFALO-SPRINGFIELD
ROLLER COMPANY**

Springfield, Ohio

The oldest and largest builders of road rolling equipment in America

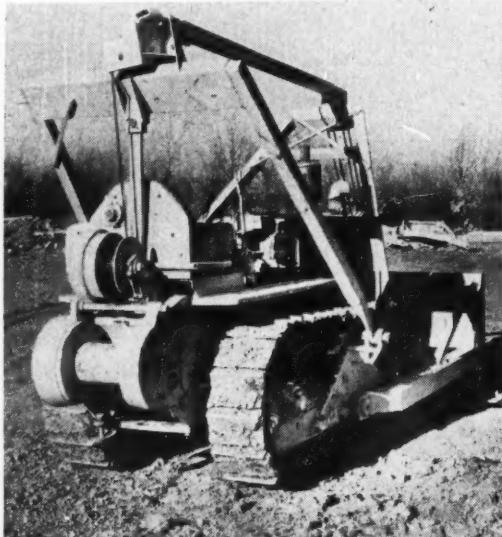
DIRECT-LINE SWAGED HOOK that can be swaged to the cable is said to provide safer and faster method of fastening and to eliminate costly splicing and the rough, dangerous edges that splicing so often leaves. New hook has a straight shank



and is made from alloy steel in a precision forging operation that retains the full strength characteristics of the steel. It is so designed that the load is on a direct line from the cable. Besides its swaging features, other advantages are claimed for the new hook, such as smooth inside surface, round throat, ample radius and finished point. Hook illustrated takes $\frac{1}{4}$ -in. cable. Other sizes are available for $\frac{3}{16}$ to 1 in. cable.—Poulson & Nardon, Inc., Terminal Box 2398, Los Angeles 54, Calif.

* * *

POWER CONTROL UNIT AUXILIARY DRUM although designed for bulldozer operation, when used with Hyster towing winch provides many additional hoisting and towing services for Caterpillar D4 and R4 tractors. Single, quick-acting



**You'll Find Special
Advantages in Every
DIXON Product . . .**

Patented features of design and construction incorporated in DIXON hose couplings, nipples, menders and clamps, assure important service benefits in every application. The products listed below provide typical examples.



**"KING"
COMBINATION NIPPLE
WITH PATENTED
"COR-O-ZIG" CORRUGATIONS**

Made from malleable iron or brass, with two-way "Cor-o-Zig" corrugations and two lug wrench stops. Widely used in place of regular iron pipe nipples. Sizes: $\frac{1}{2}$ " to 6", inclusive.

ADVANTAGES—Designed to fit straight end hose (without enlarged ends), and can be readily reset when necessary. Easier to insert in hose, because of spiral corrugations on end portion. Greater holding power under clamp pressure by reason of zig-zag corrugations on other half of shank, which also prevent nipple from turning in hose.



**"KING" Single and
Double Bolt CLAMPS**

The strongest clamps of their kind, and easiest to attach. Bolt lugs are heavily reinforced, while tongue, and ears for vice jaws, are full width. Single bolt sizes fit hose from $\frac{1}{8}$ " to $\frac{5}{4}$ " O.D.; double bolt, $3\frac{1}{2}$ " to $17\frac{1}{4}$ " O.D.

ADVANTAGES—Perfect conformance to hose perimeter, with broad bearing surface, insures equally distributed compression when clamps are tightened, without cutting into hose cover and carcass. Double bolt style has quadruple take-up, providing exceptional gripping power.

Sold by Manufacturers and Jobbers of
Mechanical Rubber Goods

DIXON
VALVE & COUPLING CO.

Main Office and Factory: PHILADELPHIA, PA.
BRANCHES: CHICAGO BIRMINGHAM LOS ANGELES HOUSTON



NOW you can get a NEW Homelite Portable Pump

The new Model HR Homelite Self-priming Pumps are now coming off our production line.

However, only a few are being built . . . a limited quantity each month for essential civilian use. Your priority rating is your "ration coupon."

True to Homelite standards, these gasoline-engine-driven self-priming pumps are easily portable and extremely rugged. They have a large capacity . . . 28 foot suction lift . . . keep seepage at strainer

level . . . and are non-clogging, fool-proof and weatherproof. A new engine design gives increased power . . . with a reduction in weight.

These new Homelite Pumps can be furnished with fittings for 2" or 3" hose . . . and the two size fittings are interchangeable.

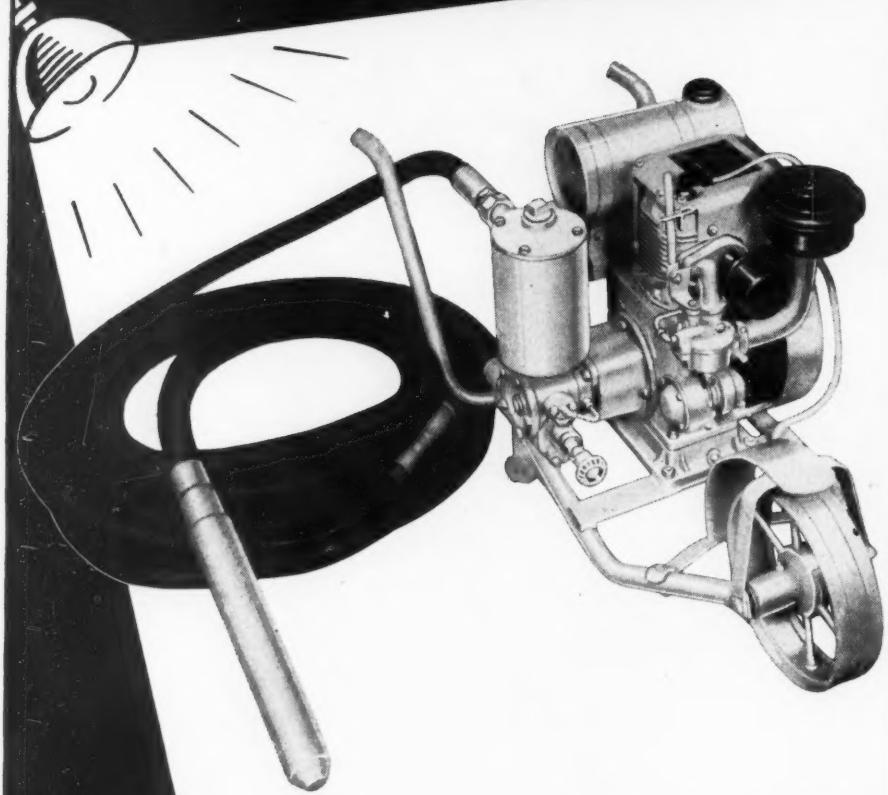
Write today for complete information and prices on these new Model HR Homelite Portable Pumps. Don't forget to give us your priority rating.



HOMELITE CORPORATION
PORT CHESTER, NEW YORK

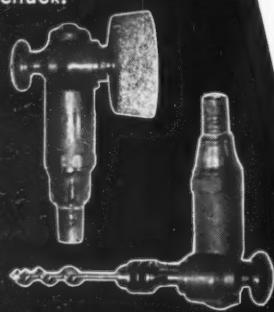
POR TABLE PUMPS • GENERATORS • BLOWERS

for GENERAL CONCRETE CONSTRUCTION



JACKSON HYDRAULIC CONCRETE VIBRATOR

Concrete grinder attachment quickly interchangeable with hydraulic vibrator head, for wet or dry rubbing. Easily converted into boring tool or drill with three jaw chuck.



For years, the most dependable and efficient, all-around internal vibrator for the general concrete contractor. Vibrator head size $2\frac{3}{4}'' \times 21''$ — right for heavy duty and wide range of conditions. Adjustable frequency — 4000-7000 V.P.M. Correct amplitude and frequency. Continuous forced lubrication of all vibrator parts. Oil-powered, gas engine — hydraulic pump drive. Husky Wisconsin engine — 4.7 H.P. The leader in the famous Jackson Pioneer Line for years — the Jackson Hydraulic Vibrator is built to take it under severe, continuously operating working conditions, at lowest cost of maintenance.

THERE IS A RIGHT JACKSON
CONCRETE VIBRATOR FOR EVERY JOB

ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON MICHIGAN

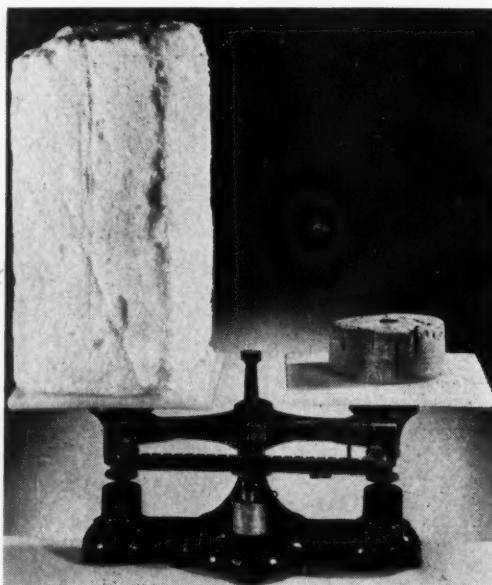
control lever is conveniently located alongside driver, providing finger-tip response for lifting or lowering blade. High-grade cast-iron drum has more cable capacity to reach out farther which increases its range of usefulness. Positive working drum ratchet is provided for boom topping service and for holding loads suspended. Protected brake and clutch are located high above contact with road. Driving mechanism requires no lubrication attention as this is taken care of from winch transmission. Extra jobs made possible for tractor by auxiliary drum unit: (1) topping boom on tractor crane unit; (2) yarding piling for a piledriver or operating a piledriver hammer; (3) serving as a haulback drum for double drum applications; (4) for light scraper and dragline work; (5) for cleaning ponds where line speed is more important than line pull; (6) operating an elevator for building construction.—
Hyster Co., Portland, Ore.



FIRE-RETARDANT TREATMENT FOR WOOD for use of architects and engineers and labelled Pyrosete or Class "D", combines fire and decay resistances applicable to lumber, timber or plywood and can be used for any type of structure from small prefabricated homes to the largest and most fireproof mercantile or manufacturing building. Also available is a new surface application designed to make wood so treated fire, decay and water resistant.—**Protexol Corp., Kenilworth, N.J.**



PLASTIC FOAM, combination of synthetic plastic materials foamed and then solidified and called "Flotofoam" and said to weigh one seventh as much as cork, is being manufactured for important war uses and will be widely used for in-

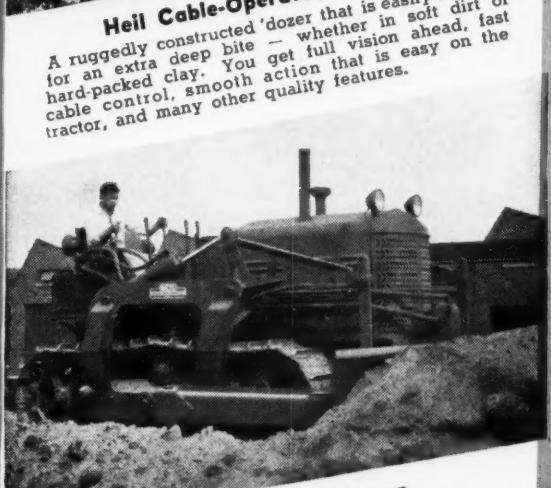


sulation in post-war home building. Although it has great buoyancy, it is semi-rigid and because it contains so much air space, it has good insulation and sound-deadening properties in comparison to its weight. Normal weight less than $1\frac{1}{2}$ lb. per cu. ft. Can be made to weigh as little as $\frac{3}{4}$ lb. per cu. ft.—**United States Rubber Co., Rockefeller Center, New York City.**



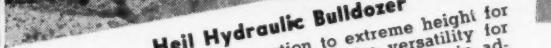
Heil Hi-Speed Cable Scraper

A push-loaded unit that gives you a heaped 15-yard load in 40 to 50 seconds. At the fill, the load is dumped and spread by a mechanical push-out action attained by tilting the floor. You get fast digging — fast hauling — fast dumping.



Heil Cable-Operated Trailbuilder

A ruggedly constructed 'dozer that is easily adjusted for an extra deep bite — whether in soft dirt or hard-packed clay. You get full vision ahead, fast cable control, smooth action that is easy on the tractor, and many other quality features.



Heil Hydraulic Bulldozer

From full-floating blade action to extreme height for throwing, these units give you extra versatility for a wide variety of jobs. Leak-proof unit stays in adjustment and needs but a minimum of maintenance.

You get speed of operation plus rugged, long-life construction with the...

Heil Bottom-Dump Wagon

The clamshell principle of high-clearance, power-opened, cable-controlled doors has made the famous Heil Bottom-Dump Wagon an amazing performer. It travels at speeds up to 27 m.p.h. — drops the load in a flash or spreads it almost like a cable scraper . . . turning at will off the windrow . . . moving over the fill with little or no slackening of speed.

The unit is designed to maintain this performance over a long, useful, trouble-free life. The body is an all-welded steel-plate unit reinforced with sturdy, welded box sections. The big tires, well-distributed load, and easy maneuverability enable you to keep going on soft or rough ground.

You can stay out in front — in reputation and profits — with this modern, fast-operating, good-looking unit. Write for bulletins giving full details on Heil's advanced design or —

See Your Heil Distributor

R-44



THE HEIL CO.

GENERAL OFFICES

MILWAUKEE 1, WISCONSIN

Look for the  **ARMSTRONG BROS.**
BETTER PIPE TOOLS

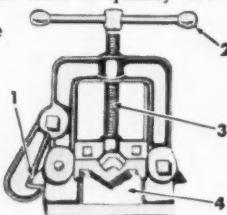


Only "ARMSTRONG BROS." Pipe Vises offer all these important features:

Solid centered jaws that prevent bending of small pipe, thin walled conduit and tubing. Oval-ended handles that will not pinch hands. Extra strength where strength is needed... and a fineness of design and an accuracy in machining that marks each a quality tool.

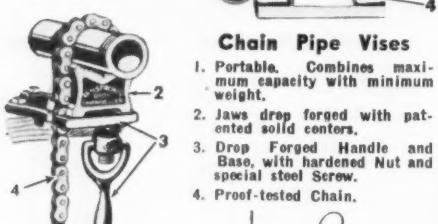
Standard Pipe Vise

1. Unbreakable drop forged steel hooks.
2. Oval handle ends, will not pinch hands.
3. Special steel screws with long-wear threads.
4. Replaceable tool steel jaws, small sizes with solid centers.



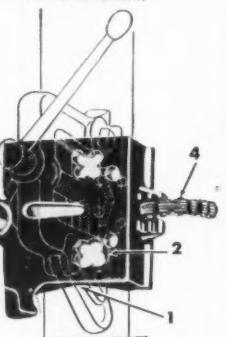
Chain Pipe Vises

1. Portable. Combines maximum capacity with minimum weight.
2. Jaws drop forged with patented solid centers.
3. Drop Forged Handle and Base, with hardened Nut and special steel Screw.
4. Proof-tested Chain.



Pipe Vise Saddle

1. Attaches instantly to round or square posts.
2. Slotted to hold standard vises of all makes.
3. Handle drop forged with hardened steel nut.
4. Link chain proof tested.



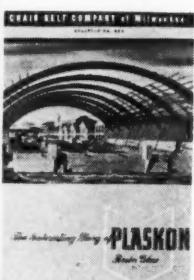
ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
334 N. FRANCISCO AVE. • CHICAGO, U.S.A.

Eastern Sales Office: 199 Lafayette St., N. Y. 12, N. Y.
Pacific Coast Office & Warehouses: 1275 Mission St., San Francisco 3, Calif.

NEWS FROM MANUFACTURERS

About Their Products

The publications reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.



RESIN GLUE—Plaskon Div., Libbey-Owens-Ford Co., Toledo, Ohio. (28 pp., illustrated). Tells story of resin glue, giving its history, the development of modern, permanent bonding, waterproof resin types, methods of using them in fabricating, and a wide range of present-day applications. Nearly all applications are illustrated, giving the reader visual proof of resin glue's adaptability to many fields of manufacture.



OIL-BASE CEMENTS, SEALERS, COMPOUNDS AND PAINT PRODUCTS—Dolphin Paint & Varnish Co., Toledo, Ohio. (18 pp.) Features complete line of Dolphinite products such as acoustic cement, aluminum paints, aluminum waterproofing, anti-rust coatings, barn paints, calking compounds, cement floor paints, cork cement, dryers, enamels, enamel undercoats, glazing putties, heat-proof aluminum, ready-mixed house paints, varnishes, wall size, washable flat wall paints and wood floor paint.



LUBRICANTS—Amalie Div., L. Sonneborn Sons, Inc., 88 Lexington Ave., New York 16, N. Y. (12 pp., illustrated) Describes line of lubricants for lubrication jobs from chassis to wheel bearing, steering gear, universal joints, water pump, underdrive, shackles, springs, hypoid gears and other vital parts. Divided into three sections, Chassis, Transmission and Differential, and General, the booklet contains a quick-finding index enabling the reader to choose the right lubricant for every purpose.



CABLE CONNECTIONS FOR ELECTRIC WELDING—Tweco Products Co., P. O. Box 666, Wichita 7, Kansas. (12 pp., illustrated) Describes complete line of cable connections for electric welding. Items shown include electrode holders, plain and insulated, ground clamps, cable connectors, machine terminals and cable lugs. Three pages devoted to complete quantity price and parts list.

Ready-Made Concrete Forms for Piers or Columns



Sonotube
Laminated Fibre Tubing

6 Standard Sizes

Up to Twenty-Four Feet Long

INSIDE DIAMETER					
8"	9"	10"	11 1/4"	12"	13 1/4"
50.26	64	78.54	100	113.1	144
SQUARE INCHES					

Smaller sizes available.

SONOTUBE Concrete Pier and Column Forms are priced for one-time use—to Save Time, Labor, Lumber and Money. Cut to desired lengths (heights) on the job. Minimum bracing required.

WRITE FOR DELIVERED PRICES

Immediate Delivery



SONOCO PRODUCTS COMPANY

HARTSVILLE, S. C. MYSTIC, CONN.
ROCKINGHAM, N. C. GARWOOD, N. J. LOWELL, MASS.

WHEN THE INDUSTRIAL GIANT RETURNS TO CIVILIAN PRODUCTION

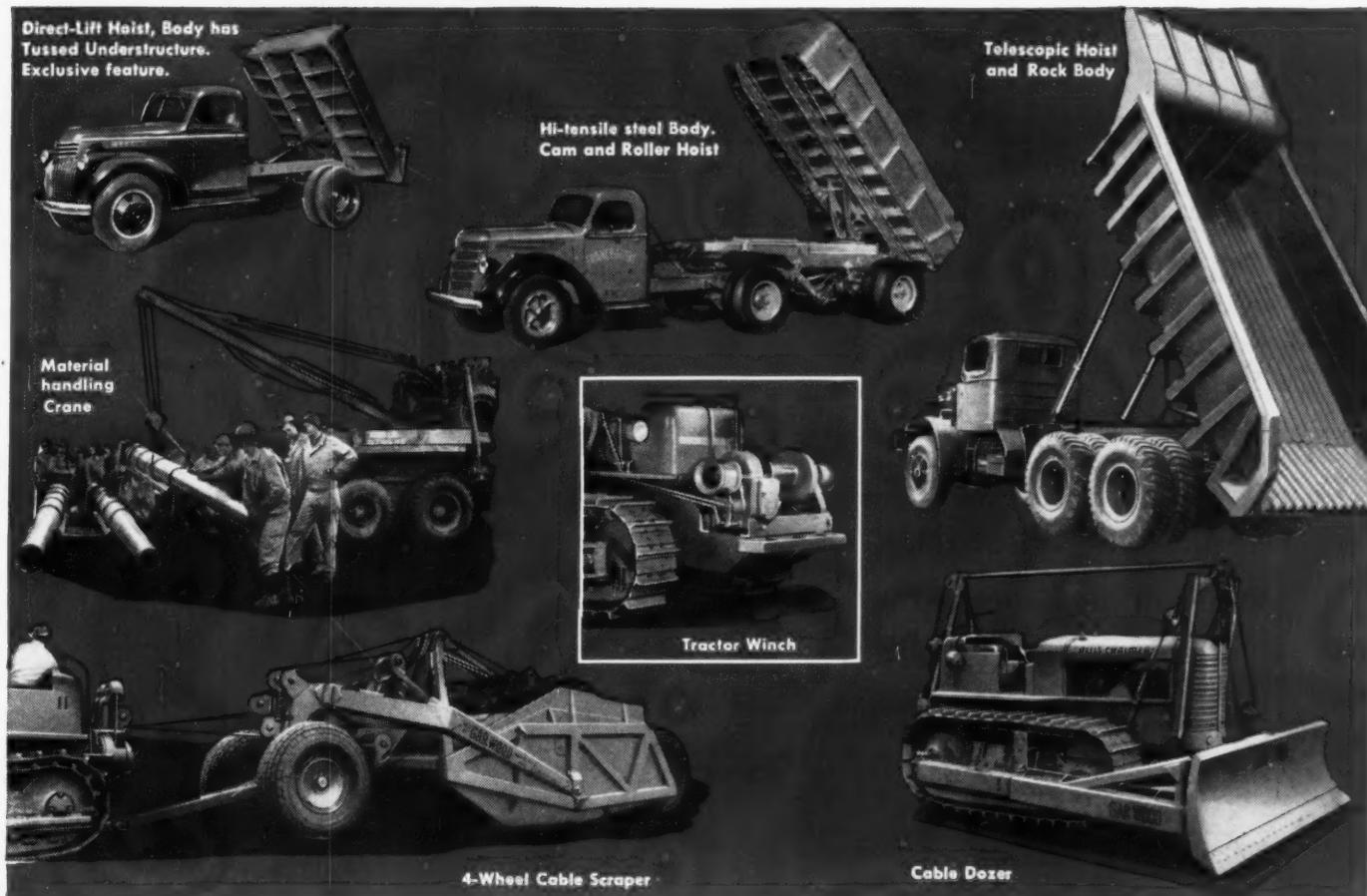


GAR WOOD *Specialized Equipment* will serve again

Gar Wood equipment is "slugging it out" with the enemy on all fronts . . . performing a hundred and one specialized jobs that are a part of modern industrial warfare. Gar Wood engineers are experts in designing equipment for rugged, dependable service.

It is our purpose to produce the best possible equipment of war in whatever quantities are needed by our fighting men. When Victory has been won, Gar Wood equipment will again be available for civilian use.

BUY U. S. WAR BONDS TO ASSURE EARLY VICTORY



GAR WOOD INDUSTRIES, INC.

DETROIT 11, MICH.

HOISTS AND BODIES, WINCHES AND CRANES, TANKS, ROAD MACHINERY, HEATING EQUIPMENT, MOTOR BOATS



One Sure Way TO COMBAT SICK ABSENTEEISM



- One of the chief causes of sick absenteeism is common colds, "flu" and such mouth-borne infections.
- A sure way to help combat the spread of such infections is the use of individual drinking cups.
- The Dixie Portable Water Carrier provides cool, clean drinking water in individual Dixie or Vortex Cups.
- Its use on the job lessens the risk of "passing on" mouth-borne disease germs.
- It helps reduce sick absenteeism.
- It cuts out trips to the water wagon.
- It cuts down time spent in "visiting" and otherwise wasted.
- It can help you step up schedules — beat contract dead-lines.

Write for descriptive folder giving complete information on this portable water service, including tanks, dispensers and cups. Dixie and Vortex Cups are made at Easton, Pa., Chicago, Ill., Darlington, S. C. and Toronto, Canada

DIXIE CUPS

DRINKING CUPS AND FOOD CONTAINERS



TACHOMETERS—**Jones-Motrola Co.**, Fairfield Ave., Stamford, Conn. (illustrated folder) Describes four models of Jones individual-mount tachometers and the Jones multi-range portable hand tachometer. Bulletin shows both full face and profile views of the individual tachometers, rpm ranges available, mounting dimensions, and includes prices for tachometers and appurtenances, a section on use and operation and general installation data.

★ ★ ★



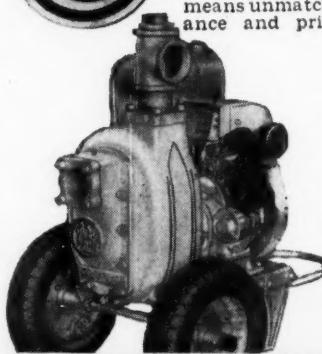
CELLULOSIC THERMOPLASTICS — **Cellulose Products Dept., Hercules Powder Co.**, Wilmington 99, Delaware. (22 pp. illustrated). New technical booklet lists and describes results of dimensional stability tests on cellulose plastics at high temperatures and high humidities. Data indicate that high acetyl cellulose and cellulose acetate butyrate have similar dimensional stability when exposed to testing conditions simulating temperate and tropical climates while ethyl cellulose plastics have superior dimensional stability. Color sketches, photographs, four comprehensive tables, and explanation of test conditions, and a discussion of data contained in the sketches, photographs and tables make this booklet a comprehensive source of engineering data. Interest in dimensional stability of plastics has been greatly intensified since the war started because of military requirements. Before the war emphasis was on beauty and glamour; since the war the emphasis has shifted to strength and endurance.



They Can Take It
DUAL PRIMERS



When it comes to DURABILITY, CMC Dual Primers have the "guts" to stand up to those tough, steady 24-hour grinds. DUAL PRIME means unmatched performance and priming speed.



A husky 3" CMC Dual Prime. One of the complete line from 1½" to 10" sizes. Also 3" and 4" Diaphragms. Get catalog.

CONSTRUCTION MACHINERY CO.
Waterloo, Iowa
Mixers • Pumps • Hoists • Batching & Placing Equipment • Saws • Carts • Barrows



The Haiss Distributor
has complete catalog
data—or write us.

When you get right down to cases, and *loading cost per yard* is the measuring stick—the Haiss Loader is not high priced at all. It never tried to be a cheap piece of machinery. Its purpose has always been to satisfy the many who wanted the one which would save money in the long run... That's why Haiss puts a big, husky gearset into it. One that's engineered for Loader service—with the clutches as well as gears running in oil... That's why so much design attention is paid to making the Haiss a machine that costs *least* to maintain... You can't afford to buy without investigating Haiss first.

GEORGE HAISS MANUFACTURING CO., INC., 139th ST. & CANAL PL., N.Y. 51, N.Y.



HAISS

PORTRABLE CONVEYORS ★ LOADERS ★ CLAMSHELL BUCKETS



Self-cleaning

The Insley Type K Excavator ($\frac{3}{8}$ or $\frac{1}{2}$ -yd.) is a real "mudder." Crawlers are self-cleaning . . . long and wide . . . individually controlled. This combination of features provides a high degree of mobility . . . prevents hang-ups in the soft spots . . . assures fast, easy handling in the closest quarters.

Here is but one of many outstanding features of Insley design and construction that you'll want in your postwar dirt moving and material handling equipment. Get the complete story now. Be among the first to specify an INSLEY Excavator when production for civilian needs is again resumed.



TUBULAR STEEL WELDED SCAFFOLDING—Universal Fittings and Scaffolding Co., Zelienople, Pa. (12 pp., illustrated) Describes company's complete line of tubular steel welded scaffolding, ladders and towers. New designs and photographs of late installations are included in the catalog as well as descriptive material on Universal line of scaffolding and towers for industrial needs, "Eze-Bilt" steel scaffolding for interior and exterior applications and "Eze-Bilt" sectional scaffolding. This equipment can be bought, leased or rented. It can be used on even or uneven bases and is adaptable to practically any height. Units require little storage space and are interchangeable for vertical or horizontal applications.



AIR CONTROL FOR SHALLOW WELL-TYPE PUMPS—Manning, Maxwell & Moore, Inc., Bridgeport, Conn. (4-p. folder, illustrated) Describes and illustrates features of this new unit which include rubber diaphragm as the one single moving part which combines valve head gland seal and float hinge. Valve has stainless steel orifice and is completely sealed, having no water cavities. Either cast brass or cast iron body. Unit is compact, lightweight, measuring $1\frac{3}{4}$ in. between wrench flats. Control is for applications up to 80 lb. psi. tank pressure.



Post-War Construction

(Continued from page 97)

in Greece, Poland and other European countries, but a study of these projects indicates that the reason for turning the work over to Americans was that the Americans were able to carry out the financing through American bankers because the projects showed a good potential income which would pay off the loan. In these cases the American bankers had an opportunity to specify the contractor who would do the work. There may be a few of these projects in Europe after the war, but the difficulty of financing them seems insurmountable unless the financing is carried out by the United States Government. It has not been the practice of the United States Government in making loans to a foreign country to specify that the work shall be done by American contractors, and I very much doubt that there will be any change in this practice.

I call attention to this work in Europe because it has been said many times that immediately after the war the construction industry would have a wonderful opportunity in rebuilding stricken Europe. I do not believe that we contractors can depend on European work during the re-conversion period after the war, and

(Continued on page 147)

Q { Will "M. P. T."* be important when construction starts up?



A It sure will! For example—one contractor was losing time on 5 machines through slow lubricating methods. With an Alemite Portable Service Station, power lubrication was brought "to the job." Lubricating time was cut 50%—gaining 100 minutes "M. P. T."* per day. The savings in time, maintenance and machines soon paid for the new method. While you're waiting for construction to start again, why not get all the facts? Use the coupon.

*More Productive Time



Q Can track roller bearing wear be reduced?

A Certainly! For instance, one contractor was beset by an epidemic of track roller bearing failures. He decided to switch to "on the job" power lubrication. Track roller and other bearing failure dropped 25%. Shut-down time was saved and put back into production. Consumption of lubricants dropped almost 20%. Yep! It was an Alemite Portable Service Station... and why not find out more about it?



Why You Need the Advantages of Alemite Portable Service Stations.

- They're used to provide high pressure power lubrication of all bearings equipped with pressure gun fittings. This covers practically every type of machine. They provide rapid filling of gear housings, final drives, rear axles, transmissions and crank cases. And Alemite Portable Service Stations bring all these services to the machines, right on the job!

What's more these versatile outfits are also used for tire inflation, engine cleaning and paint spraying. The unit includes high- and low-pressure Alemite Barrel

Pumps, Alemite Motor Oil Dispenser, hose reels and gas engine air compressor. These Alemite units have proved their efficiency on hundreds of construction projects everywhere. The savings they make in money and machines marks them as an important factor to consider in meeting your competition of the future.

FREE! Illustrated catalog describing Alemite Portable Service Stations. Also, complete catalog of individual Alemite lubricating equipment. Send coupon for your copies.



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REG U.S. PAT OFF.
First in Modern Lubrication
CONSULTATION • ENGINEERING • EQUIPMENT
LUBRICANTS • MAINTENANCE

ALEMITE, 1840 Diversey Parkway, Chicago 14 Illinois.
In Canada: Belleville, Ontario.

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 ALEMITE PORTABLE SERVICE STATIONS
 ALEMITE INDUSTRIAL LUBRICATING EQUIPMENT

Company _____

Name _____

Address _____

City _____ State _____



Baker bulldozers and gradebuilders are not adapted to—they're built specifically for—Allis-Chalmers tractors. They go together as snugly as a collar and tie. Look good together too! You get greater efficiency from your A-C power by using Baker equipment.

Since the introduction of the first A-C crawler tractor—over two decades ago—Baker has designed and



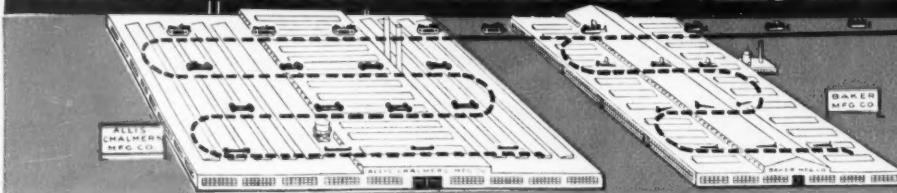
built hydraulic bulldozers for every model A-C tractor as it was introduced. There's a model of Baker bulldozer and gradebuilder for every model of A-C crawler tractor. Today

Bakers are predominantly favored by users of A-C tractors—because these users have found that they go together! Bakers are sold exclusively through Allis-Chalmers industrial tractor dealers.

THE BAKER MFG. CO.
568 Stanford Ave., Springfield, Ill.

If it concerns Victory, it concerns us!

"STRAIGHT THROUGH" ASSEMBLY LINE - ALLIS-CHALMERS TO BAKER TO YOU!



The modern Baker plant with its completely equipped fabricating, machining and blacksmithing shops adjoins the Allis-Chalmers crawler tractor plant. When you order an A-C tractor with Baker bulldozer or gradebuilder, your tractor leaves the A-C assembly line, crosses a narrow court and goes on the Baker final assembly line.

(Continued from page 144)

therefore we must look elsewhere for business.

South American Prospects

South American countries during the war have accumulated a large amount of American dollar credit because they have been unable to purchase various materials which they have urgently needed, but which would not be released by our Government. As a result of this increase in American credit and also loans made by our Government to these South American countries, they have grandiose ideas regarding development when it shall be possible to obtain materials. At the same time most of these South American countries are developing a strong nationalistic spirit and are beginning to insist that local contractors carry on the work. It is true that at the present time American contractors are having quite a little success in obtaining contracts in South America, but a large part of this success is due to the fact that the American contractors could obtain, or have had, the necessary equipment to carry on the work. My visits to South America convince me that the native contractors are watching very carefully the execution of these contracts by Americans, and they undoubtedly will give up the extensive use of hand labor, on account of the rapidly increasing cost of this labor, and change to the use of American construction equipment.

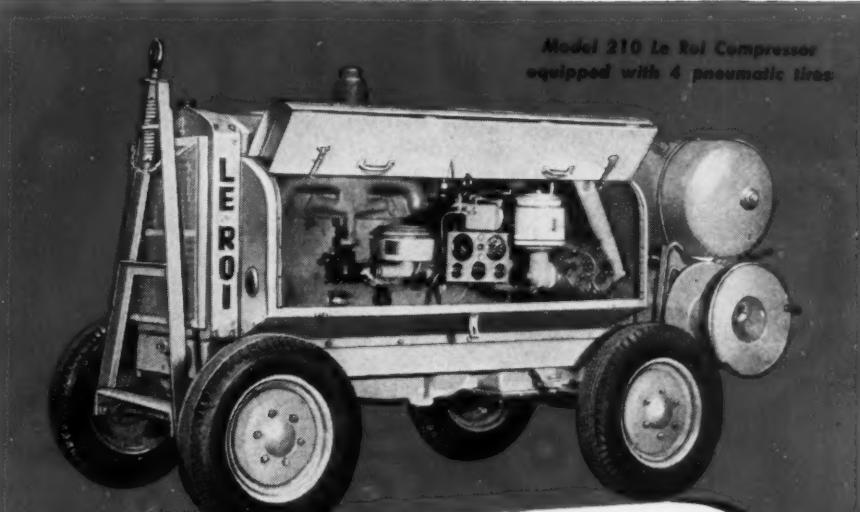
This may bring on a competition which will become so serious that it will make it practically impossible for American contractors to take this work on a profitable basis. The native contractors may not have the efficiency of the American contractors, but I think we who have done work abroad realize that the high cost of American overhead is the most serious handicap that we face in open competition with a local contractor who can obtain the necessary equipment. American salaries are high, and when we allow in our estimates the cost of maintaining this overhead during rainy seasons and delay time we soon find ourselves with a very high estimate. The native contractor does not face this handicap.

I do believe that some companies who specialize in certain lines of construction can operate successfully in South America for some years to come, but the ordinary construction contracts may be very difficult to obtain. It is safe to say, however, that the volume of business in South America will not be sufficient to employ the excess capacity of American contractors during the period from now to the end of the war and during the reconversion period.

I am firmly convinced that after the war there will be considerable work for

(Continued on page 148)

Model 210 Le Roi Compressor
equipped with 4 pneumatic tires



LE ROI

Portable Air Compressors are "Le Roi-powered" to give you more air ... faster!

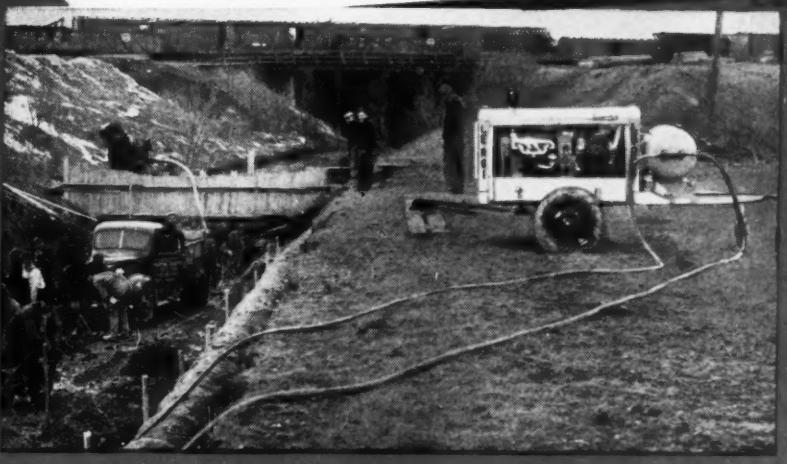
You save time and money on fast-moving schedules — when Le Roi Compressors with dependable "Le Roi power" are on the job.

With Le Roi Power, you avoid complicated and costly overhaul jobs because of quick-maintenance features such as removable wet sleeve cylinders, hardened valve seat inserts, valve-in-head construction, and many others. You get the benefit of design and construction features that give you plenty of power to build pressure — with an extra margin of reserve for the pinches.

Le Roi is the only make in which the same manufacturer builds both engine and compressor—a perfect team, designed and built to work together.

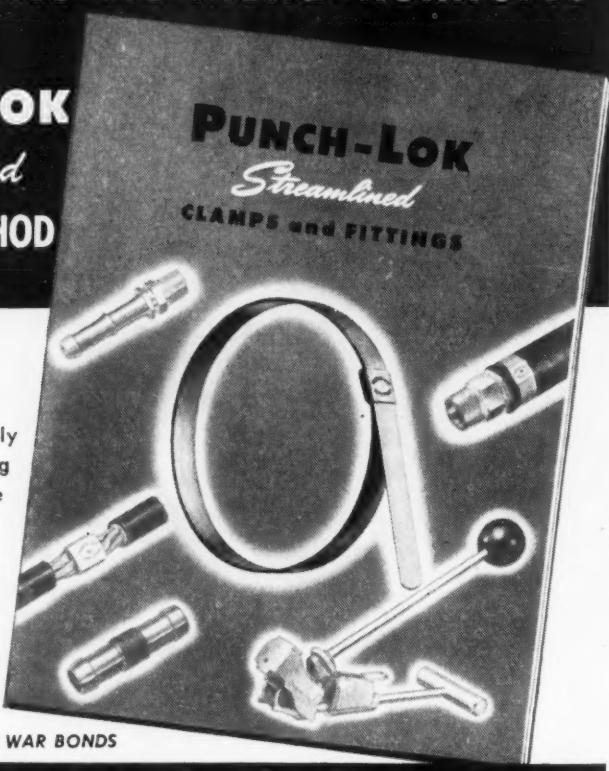
Ask your nearby Le Roi distributor for all the details, or write for bulletins.

Le Roi Company
1712 S. 68th St. Milwaukee 14, Wis.
Distributors and Service Stations in Principal Cities



Clamp-Splice-Tie-Mend-Reinforce
with
PUNCH-LOK
Streamlined
BANDING METHOD

Punch-Lok Clamps, quickly applied with the Loking Tool, save money and time in your production and maintenance operations. Send now for descriptive catalog and name of nearest distributor.



PUNCH-LOK COMPANY

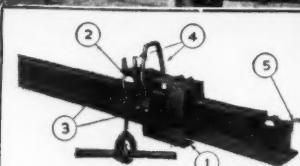
Dept. Q, 321 No. Justine St., Chicago 7, Illinois

NEW MASTER VIBRATORY SCREED
Places up to 6,000 sq. ft. of concrete per hour!



THIS new vibratory finishing screed makes possible accurate strike-off and compaction of concrete slabs in one easy operation. *No additional vibration or floating is required.* Saves time and manpower in placing floors, aprons, runways, roads and service areas. Models: VS-6 ft.; VS-10 ft.; VS-13 ft.; VS-16 ft.; VS-20 ft.; and VS-25 ft.; all models adjustable for length. Wider widths or special shape vibratory screeds to your requirements. All vibratory screeds powered by economical 1½ HP variable-speed gas engines including Master Automatic Clutch.

Write for Bulletin 596 for complete details.



1. Adjustable spring mounted shoes
2. Two way draw
3. Easy adjustment for length
4. Yoke for lifting
5. Remote engine control

MASTER VIBRATOR COMPANY

Dayton 1, Ohio • Distributors throughout United States and Canada

Products Include: Concrete Vibrators • Gas or Electric Surfacing Attachments, High Speed Tools • Vibratory Concrete Finishing Screeds • Rotary Concrete Floor Finishing Machines • Portable Gas Electric Generator Plants; 500 Watt to 17000 Watt, Voltage Regulators and Portable Mountings Optional • Master Flood and Shovel Lights • Electric or Gas Engine Driven Power Blow Hammers



(Continued from page 147)

American contractors in the Philippines and in the Dutch East Indies, and perhaps later in China. The competition in these fields will not come from the local contractors as the construction industry in these countries has not been developed to the same extent that it has been in Europe. Again I state that it can hardly be hoped that work in the Far East can be started promptly or even during the period of reconversion, which I have suggested would cover perhaps a year and a half. There may be exceptional cases where American concerns which have investments in these Far Eastern countries will want to make an immediate start, but the time of starting a large volume of work will depend on the length of time required to arrange the necessary finances.

I do not believe that I am being unduly pessimistic in these statements, but I believe that we must face the facts, and by doing so we can better answer the second question of interest to contractors, and that is: "What program can we follow that will best equip us for the business to come after reconversion?"

We are in a transitional stage from the point where, in order to meet the demands of war, we enlarged our organizations beyond anything we ever dreamed of before. We now face a sharp curtailment in business for an unknown period and therefore must make careful plans for carrying on during this period if we are to continue in existence. I am still very bullish on the United States and believe that after the conversion period we will have one of the greatest booms we have ever had in the construction field. I would not dare to hazard a guess as to how long this boom will last.

Invest in Construction Personnel

The wise contractor is therefore going to face the prospect that for the next few years there will be only a moderate amount of construction work and that it will be carried out under the keenest competition, and the income from construction will shrink materially. My recommendation of procedure during this period may sound radical, but it is based on common sense.

Every good businessman today is giving careful consideration to the proper kind of investment so that, regardless of deflation or inflation, the value of his investment in future years and the return on the investment will be equal to its present buying power. Many people are investing in projects which produce no revenue today but which may, in future years, have a value that will make a proper return. I have listened to many discussions of this problem and I have arrived at the conclusion that the soundest investment we can

(Continued on page 150)



ROAD BROOMS

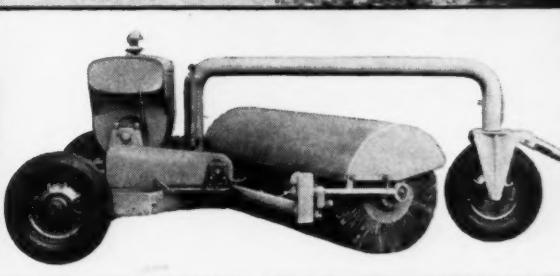
BOTH LITTLEFORD BROOMS ARE TWO-WAY BROOMS

Before applying asphalt, tar, emulsion, road oil, or cut-back to our highways, the Littleford Road Broom sweeps away the dust and dirt so that the bituminous material can make a perfect bond with the road surface.

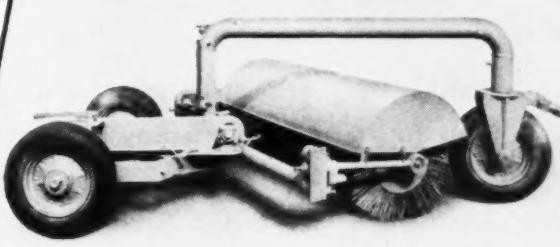
Any desired pressure of the Broom can be applied to the road surface due to the Hydraulic Lifting Arrangement which allows the Broom to be raised or lowered to give the proper tension.

Littleford Road Brooms are made in two models — Model No. 106 Traction Driven Broom and Model No. 108 Power Driven Broom. Both models can sweep either to the right or left and can be changed from one position to the other in less than two minutes time.

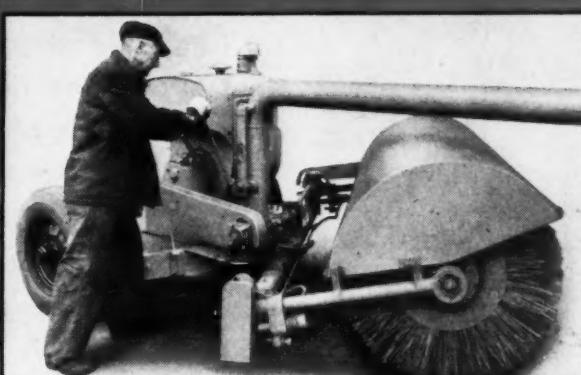
Littleford Road Brooms are the answer to better post-war roads.



MODEL No. 108 POWER DRIVEN BROOM



MODEL No. 106 TRACTION DRIVEN BROOM



Hydraulic Lift raises and lowers the Broom and adjusts the Broom tension on the road surface.



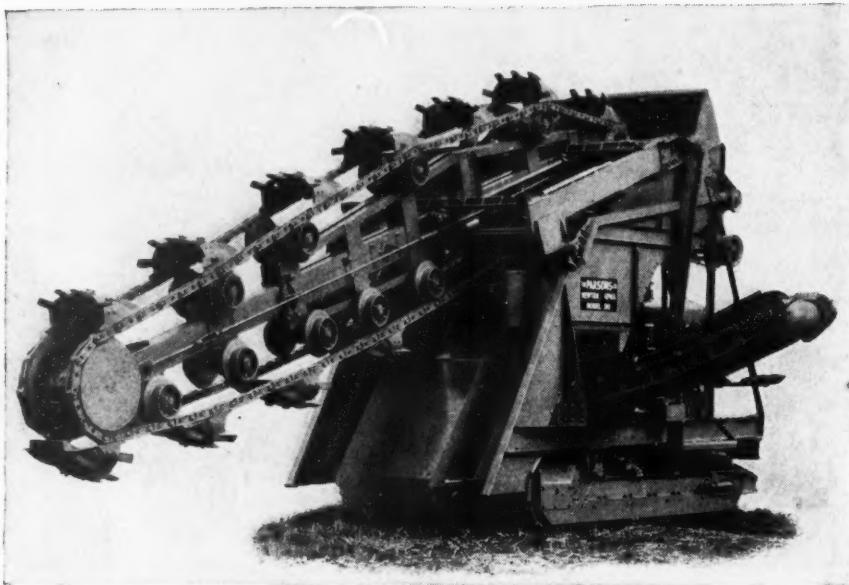
LITTLEFORD

465 E. PEARL STREET

LITTLEFORD BROS., INC.

CINCINNATI 2, OHIO

PARSONS 310 TRENCHER



HEAVY DUTY . . AND HOW IT GETS AROUND!



Heavy Duty Trencher, with built-in flexibility that gets around every digging problem. Heavy steel frame handles one, two or three booms. 90 H.P. engine, 45 forward, 5 reverse traction speeds.

Depth adjustment made easy with telescoping boom. Maximum depth: 15 feet. Digging widths: 18 to 54 inches. Offset boom sidesteps obstructions by shifting right or left across full width of boom carriage. Three point frame suspension keeps machine level, ditch vertical even though one crawler is higher than the other. Arc type conveyor can be shifted while machine digs.



Strength: Heavy Duty construction and ample engine power permits use of double or triple booms on the Parsons 310.

THE PARSONS COMPANY

KOEHRING SUBSIDIARY NEWTON, IOWA

TRENCHING EQUIPMENT



(Continued from page 148)

make today is the building up of a proper personnel that will be ready and able to carry on after the conversion period is over.

I am firmly convinced that this is the soundest investment any of us can make because, regardless of deflation or inflation, a proper personnel will return profits in the future, and in dollars at the value of the dollar at the time the work is done and in proportion to the investment made in the job. I cannot overstress the value of personnel. The records show that the life of the average contracting business is not long, and many outstanding firms have closed up because of their failure to look ahead and strengthen their organizations for future work.

I believe that we should study our enlarged organizations and retain the best men we have, and in addition where we see a weakness in our organizations we should be on a constant lookout for men who are dropped out of other organizations and who can fill the places where the weakness exists. We should watch with particular interest the men returning from the Army and Navy, and especially from the Seabees. These men,

(Continued on page 152)

**Streamlined
INSIDE for Higher
Efficiency and Lower
Operating Costs**

NO ORIFICE OR PRIMING VALVES TO CLOG OR JAM HOLDS PRIME REQUIREMENTS
CLOSE COUPLED TO MOTOR REQUIRES LITTLE ATTENTION
GAS OR ELECTRIC RUGGED SIMPLICITY OF DESIGN ELIMINATES RECIRCULATION — DELIVERS GREATER VOLUME PER GAL. OF GAS CAPACITIES UP TO 125,000 GPH

The GORMAN-RUPP CO. Mansfield, Ohio

GORMAN-RUPP
Self-Priming Centrifugal Pumps



means **EVERYTHING** *on the job*

**Yes, everything you want
in a truck you get in the
1945 model heavy-duty
CHEVROLET**

*TODAY'S TRUCKS—
designed to meet Today's
Rigorous Requirements*

Essential users qualified to purchase new trucks are urged to place their orders promptly. See your Chevrolet dealer now!

BUY MORE WAR BONDS—HELP SPEED THE VICTORY

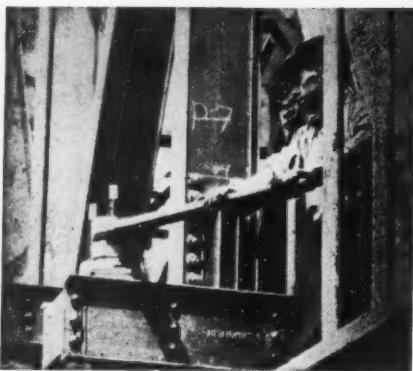
POWER. Every 1945 model heavy-duty Chevrolet truck is powered by the high-torque Load-Master engine—designed and built for truck use exclusively. Here is an engine that can exert its maximum pulling power at low engine speed (1000 to 1900 r.p.m.) and over a wide range of road speeds (from 2 m.p.h. in low gear to 32 m.p.h. in high, with single-speed rear axle).

EQUIPMENT. Every 1945 model heavy-duty Chevrolet truck carries many items of equipment that increase efficiency and reliability—including oil-bath air cleaner, heavy-duty extra-capacity radiator, 10-leaf rear springs with special auxiliary (helper) springs, and side-member plates on chassis frame. All models have dual rear wheels. Special heavy-duty front springs and special axles are obtainable in numerous combinations. Of the seven chassis combinations, two are equipped with special extra-capacity single-speed rear axle, three with two-speed rear axle. A special oversize front axle (4500-pound rating) is used in the heaviest truck of each wheelbase—134½ and 160 inches.

ONE OUT OF EVERY THREE TRUCKS IS A CHEVROLET

CHEVROLET MOTOR DIVISION, General Motors Corporation, DETROIT 2, MICHIGAN

Bridge Constructors Depend Upon LOWELL Reversible Ratchet WRENCHES



For running up nuts on anchor bolts and connections, bridgemen need wrenches that will work fast and SAFELY.

The LOWELL "Steel Socket" Bridge Builders' Wrenches—with their positive guarantee that handles will not break—meet the tough requirements of big bridge jobs.

Built in a wide range of types and sizes to cover many needs of the engineering-construction field.

Have patience with your dealer if he is unable to furnish all of the NUMEROUS LOWELL types and sizes, because we are engaged, for the duration, in supplying the needs of our Armed Forces.

LOWELL WRENCH CO.

1869 WORCESTER, MASS., U.S.A. 1945

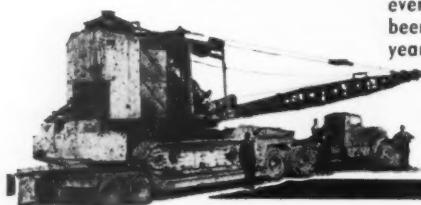


See how each pawl, when engaged, transmits leverage from the solid stock of the handle, direct to the gear, in a straight line and with a "square" contact. The pawl is in COMPRESSION ONLY—no shear, no tension, no torsion. The shipper carries NONE of the load. This strong construction insures steady service.

on *Ships Go down to the Sea* ROGERS TRAILERS



EXPERIENCE
builds 'em
PERFORMANCE
sells 'em



AMERICA'S shipbuilding industry launched more ships in 1944 than all the rest of the world combined.

ROGERS TRAILERS are a vital link in the mass-production method of ship construction for they are transporting heavy machinery . . . boilers, bulkheads, engines . . . speeding Victory ships down to the sea!

ROGERS TRAILERS are serving efficiently on the homefront too and new models which will be available when war contracts are completed, will be even more efficient than the multitude which have been so successfully operated by industry for many years.

**ROGERS BROS. CORP.
ALBION, PENNA.**

(Continued from page 150)

during the period of a few years, have developed a confidence in themselves that would ordinarily require many years of experience to obtain. They have been working under pressure and in trying conditions and know what it means to get results. I am confident that we are going to find in the ranks of the young men coming out of the Army Engineers and the Seabees well-grounded construction men who, a couple of years ago, were considered too young to carry on large projects. I know of some of the work that the Seabees have been doing and am amazed at the results obtained. Many of us contractors would be proud if we could obtain the same results in the same period of time. Some of these men are needed in our organizations.

I have recommended this investment in personnel as a pure investment, but it is going to cost us money, because without income we are bound to find ourselves spending good dollars to pay for idle time. The investment, however, will pay out in the days when we get back to normal and the big volume of business which I foresee for the future is at hand. If we are ready at that time to take on construction work and carry it on successfully in open competition we will more than repay the losses incurred by paying for the idle time of our personnel.

In closing I must, however, add one warning, and that is to avoid the old error of going into competition for work at cost in order to help pay the overhead. This has been the ruin of many contractors because taking work at cost usually means a terrific loss, and when this occurs we find that the investment is wiped out and we are without ability to continue in business.

* * *

Three-Nozzle Filler

(Continued from page 63)

8-in. conical strainer to intercept sludge formed by heating the asphalt.

Before this machine was developed a crew of 10 men, using small hand-pouring pots, had been able to seal only about 6 mi. of joint per day. With the machine and a crew of 5 or 6 men the rate of travel is about 1 1/4 mi. per hour, covering three lines of joints simultaneously, or 14.5 times the speed per man-hour made with the hand pots.

Credit for development of this im-

(Continued on page 154)

We Call Our
LINK-BELT SPEEDER
"The Machine that's Never Down!"



On the go 20 hours per day for over two years, this LS Eighty-five has won unstinted praise from its operator. Not only has it maintained a higher average loading, but it has been in tip-top shape without a moment's time out for repairs or maintenance.

Performance of this kind wins friends,—and makes money for contractors the country over.

GET A
BIG BITE
with a
LINK-BELT SPEEDER

For Prompt, Efficient, Convenient Sales and Service There Is a Link-Belt Speeder Distributor Located Near You

9654

LINK-BELT SPEEDER



Drop Forged to Insure Against Cave-Ins

Simplex
Trench and
Timber Braces
18" to 60"
long (in
closed
position)



Only Simplex Trench and Timber Braces have drop forged balls and sockets and lever nuts; providing maximum protection against cave-ins through the ultimate stress resistance which the drop hammer imparts to steel members. The blunt safety lever nut further prevents accidents. Elimination of injuries and re-digging has made their use highly profitable.

Templeton, Kenly & Co.
Chicago (44) Ill.

Simplex
LEVER SCREW HYDRAULIC
Jacks

(Continued from page 152)
proved equipment goes to the organization headed by Capt. Joseph A. Hatch, post engineer, Moses Lake Army Airfield, Washington.

Safety in Arc Welding

(Continued from page 85)

forcing rods, scrap lengths of pipe or bar laid together, or building piping are indiscriminately used.

The maintenance of adequate safety ground connections to the frames of all welding machines should be checked, because many operators do not realize their



Fig. 6 . . . NEVER SLING ELECTRODE HOLDER over shoulder nor leave electrode in holder when not in use.

importance. For the same reason, the maintenance of insulation on electrode holders should not be left to operators alone. Electrical repairs and connections on the power-line side of the welder should be handled only by competent men.

In the last analysis, it is obvious that the welding operator and his safety education plays the greatest part in preventing accidents to himself. It is undoubt-

(Continued on page 156)

* * *

Breakdowns COST Money!

Avoid 'Em! Get Done
Ahead of Schedule with

VIBER
Concrete Vibrators

Vibers are rugged and FASTER than ever—now 9500 RPM in concrete!
If time counts and breakdowns hurt, switch to dependable VIBER-ation.

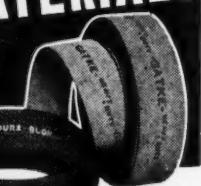
Find out about Viber's
easy-to-carry size and other
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BETTER BRAKE MATERIALS
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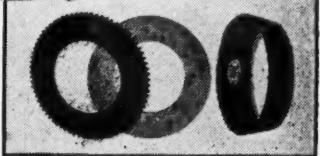
DURA-BLOK Wire-Back
Moulded Brake Block



GATKE
Heavy Duty
Woven
Brake Lining

GATKE Brake Blocks and
Frictions — Moulded in
ALL shapes and sizes to
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Clutch Facings
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GATKE High-Heat-Resisting Asbestos Brake Materials are engineered and service-proved for every brake and clutch requirement of Excavating, Road Building and Construction Equipment. Just tell us what you need.

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*... An Authoritative Guide
on Its Selection, Use and Care*

JUST off the press—AMERICAN TIGER BRAND'S new catalog—125 pages crammed with illustrations, specifications and descriptive material to help you select the wire rope that's exactly right for your particular job. In addition, special chapters feature modern methods of splicing, socketing, lubrication, and other facts essential to the proper use and care of wire rope in every field.

This catalog covers the complete range of both AMERICAN TIGER BRAND Excellay Pre-formed and AMERICAN TIGER BRAND Standard Non-Preformed Wire Rope and accessories.

This valuable book, with its quick-reference indexed pages should be in the hands of every man who buys or uses wire rope. A request on your letterhead will receive prompt attention.

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UNITED STATES STEEL

LUFKIN

"ANCHOR" CHROME CLAD
STEEL TAPE

Engineers appreciate the many advantages of the Lufkin "Anchor" Chrome Clad Steel Tape for general measuring work. Jet black markings are easy to read against a satin chrome surface that won't rust, crack, chip or peel. Genuine leather hand-stitched case on a plated steel liner is exceptionally durable. Write for free catalog.

BUY THROUGH YOUR DEALER



(Continued from page 154)
edly significant that at least one—there are probably others—of the large electrical manufacturing concerns has an unusually good accident record in regard to shocks to welders. Regardless of special instructions, the whole philosophy of such a group of workers leads to a healthy respect for all electrical circuits and proper care in handling them.

Some Welding "Don't's"

The paramount warning should be to take particular care in hot and humid weather, and when welding in wet places. Almost without exception, fatal accidents to welders occur in hot weather. The operator's own condition and that of his clothing should be his guide.

He should never wear wet gloves, shoes, and clothing, particularly clothing made of thin cotton fabrics.

The operator should never forget that his is the major responsibility for seeing that the insulation of the electrode holder is in good condition.

He should learn to carry an electrode holder by the handle—never slung over his shoulder, or squeezed under his arm. He should never, under any circumstances, transport an electrode holder

(Continued on page 158)



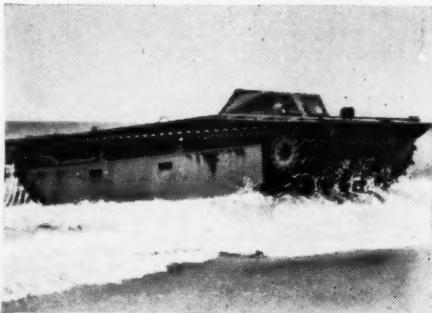
Until the War is Won

... highest priorities are diverting the new Byers excavator you want to war fronts all over the world. WHEN THE WAR IS WON Byers will offer you new, improved, faster mobile cranes and shovels for peacetime jobs.

In the meantime, owners of current and older models of Byers shovels and cranes may depend on Byers Parts Service to help them keep present equipment working steadily and satisfactorily.



AMPHIBIOUS TRACTORS FOR SALE



One of the most useful types of war vehicles now in service with the Armed Forces, particularly in the Pacific, is the amphibious tractor known as "Water Buffalo," or LVT (Landing Vehicle, Tracked).

As the designers (in cooperation with the Bureau of Ships, U.S. Navy), engineers and manufacturers of "Water Buffalos," we of Food Machinery Corporation believe there will be a postwar market for amphibious tractors redesigned and built for commercial use. The purpose of this and similar advertising is to find out if we are right.

These versatile machines travel as readily on water as on land. Their amazing mechanical stability enables them to be driven through heavy seas, across reefs, onto beaches and over the roughest terrain. Hauling cargos of men, supplies and equipment, they easily negotiate swamps, jungles, rivers and rugged country impenetrable by any other vehicle. They possess extraordinary maneuverability, power and traction... turn on a dime, knock over trees, climb like mountain goats!

Now our entire output of amphibians is going to the Army, Navy and Marines. But we have published a folder containing descriptions and specifications for a commercial amphibian. We will be glad to send this folder to interested business executives who feel that their firm might have use for a postwar "Water Buffalo."

Some of the operations for which the peacetime amphibian may be suitable are:

Mine prospecting	Timber cruising
Mining	Lumbering
Surveying	Road construction
Rescue work in flood, ice and marshland	Equipment hauling
Flood control work	Geologic work
Maintenance of oil, water, power and telephone lines	Jungle trucking
Non-navigable river transportation	Mosquito control
	Coast transportation, particularly where no dock facilities are available

Probably, after reading our folder, other uses will occur to you, possibly in your own field. Write for the folder to "Water Buffalo," Food Machinery Corporation, Riverside, California.



FOOD MACHINERY CORPORATION

RIVERSIDE DIVISION, RIVERSIDE, CALIFORNIA



Catching Tin Fish

... another use for SUPERCHARGING

Cleaving through the water at 40 to 50 miles an hour, a torpedo under test is an elusive thing to catch. But caught it must be and is, just before it sinks.

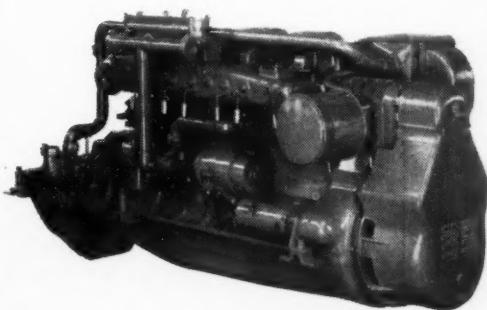
Catching these tin fish and bringing them in to be given

their war-heads, is a tough, tricky job of seamanship. It calls for speed . . . maneuverability . . . responsiveness to every change in throttle or rudder.

It is significant that the engines, made by National Supply Company, are B-W (McCulloch) Supercharged.

Providing extra power when power is needed . . . more power in a given space or weight . . . better performance at higher altitudes . . . and with little appreciable increase in weight — B-W Supercharging finds many uses in engines, both gasoline and diesel, for the marine, industrial, transportation, and automotive fields.

This SMRA-6 engine, made by the National Supply Company, is B-W Supercharged to get extra speed, power, and maneuverability with little appreciable increase in weight or cost.

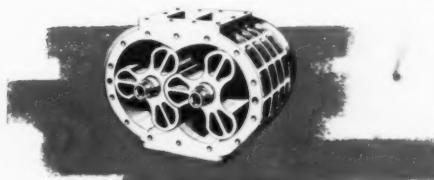


SUPERCHARGERS, Inc.

• DIVISION OF BORG-WARNER

Milwaukee 9, Wisconsin

B-W Positive Displacement Superchargers supercharge at all speeds and in proportion to the need of the engine for air.



"AMES" SOLID SHANK RETURNS FROM WAR
Same Construction... Same Specifications

For more than two years the entire production of our Solid Shank Shovels and Spades was assigned to the fighting ranks.



MADE FROM ONE SOLID BAR OF STEEL
 OXIDEON

Bronco, the King of all Standard Weight shovels and the toughest of Solid Shanks, is again ready to fulfill your requirements.

Perfect Balance



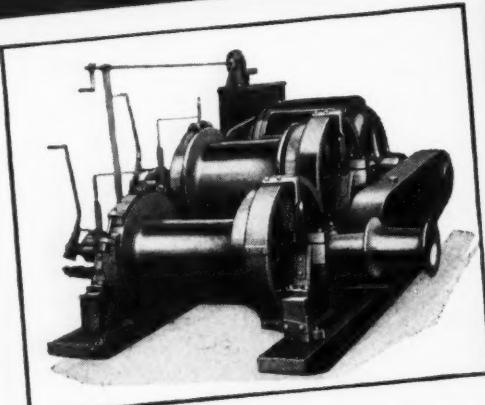
AMES BALDWIN WYOMING CO.
 PARKERSBURG, W. VA. NORTH EASTON, MASS.

(Continued from page 156)
 with an electrode or electrode stub in it. He should never throw or lay an electrode holder down so that it makes contact with any conducting material. He should never work alone in confined or concealed spaces where, for example,



Fig. 7 . . . CAUTION IS NECESSARY to avoid accidents resulting from falls when welding operator is working at height above floor or ground.

**Hoists
 to Fit
 the Job**



Lidgerwood hoists have earned a 70-year reputation for dependability and efficiency *on the job*. There's a Lidgerwood gasoline, steam, electric or Diesel hoist to fit every construction need. When you need a hoist inquire first of LIDGERWOOD.

HOISTS FOR:
 CABLEWAYS
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 CONTRACTORS
 MINES—DOCKS
 RAILWAYS

LIDGERWOOD
 ESTABLISHED 1873

Manufacturing Company
 MAIN OFFICE AND WORKS • ELIZABETH, NEW JERSEY



Fig. 8 . . . DONT DROP ELECTRODE HOLDER where it can make contact with conducting metal.

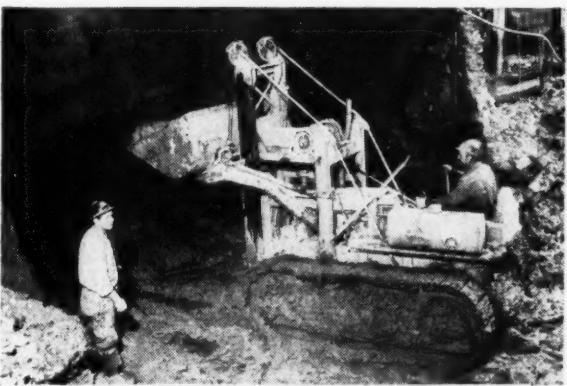
striking his head may cause temporary loss of his faculties. He should be particularly careful when working above the ground or floor, since it is significant that many fatalities involve a fall.

Case studies, incomplete as they usually are, give a basis for these recommendations. For example, in all but one of

(Continued on page 160)



Basements and foundations are excavated quickly and accurately with TRAXCAVATORS.



TRAXCAVATORS make short work of awkward close-quarter excavating jobs.

ABOVE: Big T7 with 2½ yard bucket rips up old asphalt pavement and loads it.

AN operator does more and better work with a TRAXCAVATOR because he can always see what he's doing and where he is going. Operator visibility plus compact, maneuverable "Caterpillar" track-type tractor power also assures big production even in close-quarter precision work. If you've never seen a TRAXCAVATOR in action, there's a surprise in store for you when you realize its performance and profit possibilities for a wide variety of digging, grading and loading jobs. See your TRACKSON-"Caterpillar" dealer today. Let him show you why these machines do more work on more jobs — quicker and easier. Ask him for literature or write direct to

TRACKSON COMPANY, Milwaukee 1, Wis.



A Griffin Wellpoint Job



Want a DRY JOB?

NO WATER PROBLEMS—NO SHEETING—NO DELAY for the J. C. Truman Construction Co. of El Dorado, Kansas, on this difficult river crossing. A 24-inch gas line was firmly anchored and buried at depths of 10 to 32 feet. The Griffin Wellpoint System drained up to 9,000,000 Gallons per day permitting job progress in DRY excavation all around the clock. CALL GRIFFIN for these results on your next wet job.

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JACKSONVILLE 2, FLA.

MAIN OFFICE: 881 EAST 141st STREET, NEW YORK 54, N.Y.
GRiffin WELLPOINT CORPORATION

(Continued from page 158)

nine reports of accidents, dating from 1934 to 1943, the statement was made that the weather was very hot, or that the victim's clothing was soaking wet. In five of these nine cases, a fall was involved, ranging from a height of 11 ft. to the case of a standing man who fell to a steel floor. In every one of them, the electrode holder was uninsulated, and in none was there evidence of contact with any live part other than the electrode holder. Four of the cases involved arc welding operators working in confined spaces.

Summary

This discussion can be summarized as follows:

- (1)—Arc welding is not a hazardous occupation, as judged by industrial standards.
- (2)—Electric shock is a relatively infrequent cause of death.

Where electrocution of the welding operator has occurred, one or more of three factors was usually involved: (1) An uninsulated electrode holder; (2) wet gloves and clothing; or (3) a fall.

★ ★ ★

Japanese

Army Engineers

(Continued from page 90)

or serviceability. This may be attributable to the fact that the Japanese have depended more on manual labor than on heavy equipment, which they have not taken into the forward areas in any quantity.

The construction of field fortifications has been very highly developed, and even at remote points Japanese Engineers have been successful in constructing first class defense positions from material immediately available.

Engineers have several different models of assault bridges. One type is made of lengths of steel tubing, supported by bags filled with kapok. The sections are joined together and afterwards locked. They are light enough to be carried easily by foot soldiers. Crossings of streams 100 ft. and more in width are reported possible with this type of bridge, which is intended for infantry only.

Heavier, ponton bridges are used for
(Continued on page 162)

APPLICATIONS *Unlimited!*

TONS of irresistible hydraulic power — easily carried to the job — applied speedily and *safely* at the right spot — controlled with split-hair accuracy! Yes, *Porto-Power* is the miracle hydraulic tool with unlimited applications. The *versatility* of this "educated" hydraulic jack is as astounding as the ingenuity of its users in adapting it to an amazing variety of tough jobs!

Porto-Power Hydraulic Units and attachments are made today in 7, 10, 20 and 50-ton capacities—to push, pull, lift, clamp, spread or press—in any direction, over any span. See your distributor who handles Blackhawk Porto-Power Jacks and Wrenches.

A Product of **BLACKHAWK MFG. CO.**, Dept. P2335, Milwaukee 1, Wis.



Use *Porto-Power* for MAINTENANCE!

Pulling gears is only one of hundreds of time-saving uses of *Porto-Power* in general maintenance.

Four separate illustrations arranged in a diamond shape, each showing a worker using a Porto-Power unit. 1. Top-left: A worker uses a Porto-Power unit to move a heavy machinery component. 2. Top-right: A worker uses a Porto-Power unit to move a heavy pipe. 3. Bottom-left: A worker uses a Porto-Power unit to move a heavy machinery component. 4. Bottom-right: A worker uses a Porto-Power unit to move a heavy machinery component.

Use *Porto-Power* for EXPERIMENTAL WORK!
Gauge-equipped *Porto-Power* units indicate the pressures applied, so that new materials and assemblies may be tested for strength.

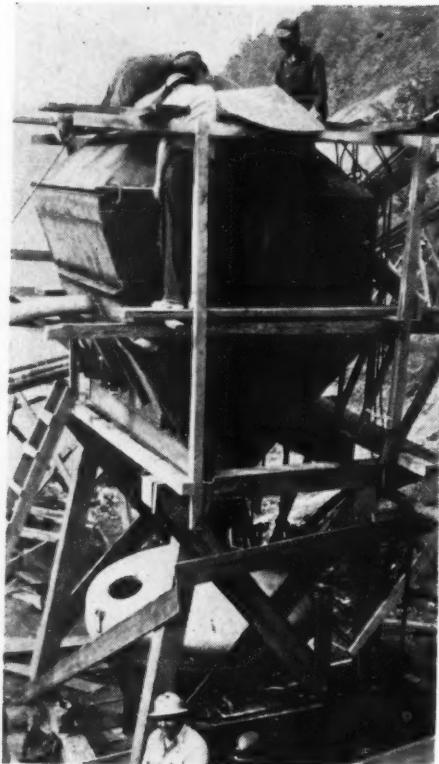
Use *Porto-Power* for PRODUCTION!
Porto-Power mounts in a compact press for production operations. Pump is "spotted" for convenience of operator.

Use *Porto-Power* for MOVING MACHINERY!
Eliminate dangerous crowbar methods. Workman, at a safe distance, sights the job and raises the heavy load easily and quickly.

Use *Porto-Power* on CONSTRUCTION!
Bend heavy pipe "cold"—without kinking—with the *Porto-Power* Pipe Bender. Electricians find *Porto-Power* invaluable in installing new conduit. *Porto-Power* also serves as an all-purpose jack.

BLACKHAWK

Air-Floating Puts Bulk Cement Where It Is Needed, Economically



**The Fast,
Efficient
"ROBINSON"
WAY**

Here is one of the Robinson installations on the TVA Fontana Dam. Bulk cement will be air-floated from this siding storage bin to the mixing plant. This entire system is 3400 feet long; with a 400 foot rise.

Moving bulk cement over rough, hilly terrain will present no problem, if you choose a Robinson Air-Activated Conveyor System. By this method, contractors have conveyed bulk cement up to 3500 feet, with rises up to 600 feet . . . and even greater distances are possible. Costs are low, maintenance almost nil and wear negligible.

The whole system is simple: Cement, in batches, is fluffed up and then carried (not blasted) through pipes to storage bins or mixing plants. There are no constantly moving parts to get out of order. Flexibility of the system permits by-passing any points to deliver cement where needed.

Write for illustrated bulletin or contact us to discuss the problems of your next contract. We'll be glad to send a representative.

• • •

ROBINSON Air-Activated Conveyor Systems
Division of MORSE BOULGER DESTRUCTOR CO.
211-C EAST 42nd STREET NEW YORK 17, N. Y.
Representatives in All Principal Cities

3-MB-1

(Continued from page 160)

artillery and heavy equipment. The Japanese are skilled in the construction of wooden trestle bridges, which they erect with great rapidity from materials prepared beforehand or available locally. Despite their flimsy appearance, they are capable of supporting artillery and other heavy equipment.

Prefabricated steel bridges are used by the Japanese, but not so widely as by some other armies. One truss construction, portable steel bridge is 48 ft. long and weighs 820 lb.

* * *

*Production Line
"Processing"*

(Continued from page 71)

of solution used and its protection is checked and securely fastened to the instrument panel and another to the filler cap. Entire cooling system is thoroughly checked against leaks. Air cleaner is removed, old oil drained, oil chamber cleaned and refilled with new oil, and wheel lugs and axle flanges tightened.

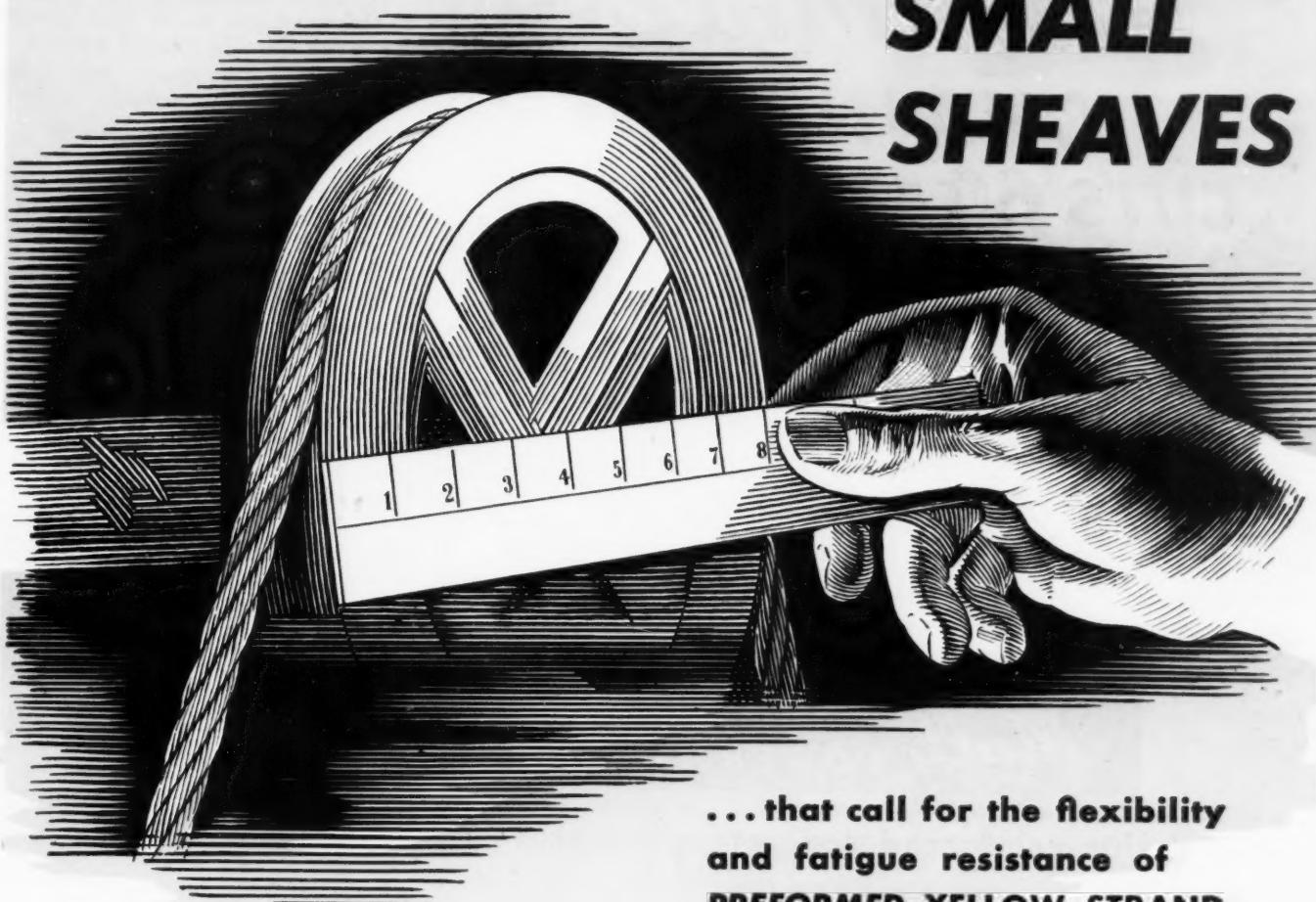
Station 4—The water pump, generator, starting motor, distributor, air compressors and all other engine accessories are lubricated. Special attention is given to choke and throttle control wires. These are worked for freedom of operation and thoroughly lubricated with lubricating preservative oil, medium. The throttle control wire housing is coated with light compound rust preventive.

Station 5—The following are tightened: entire undercarriage, body bolts, spring bolts, shackles, spring saddles, radiator anchor bolts, oil pan, gas tank, exhaust line, fenders, running board, steering mechanism, differential, transfer and transmission covers, drag links, pitman arms, shock absorbers, linkage, and all other undercarriage bolts and nuts. All upper hardware, such as hood latches, pintles, windshield wipers, and door hinges (special attention is given to piano-type hinges), are lubricated with medium lubricating preservative oil. The brake fluid is checked and, if necessary,

(Continued on page 164)

We still have with us . . .

SMALL SHEAVES



... that call for the flexibility
and fatigue resistance of
PREFORMED YELLOW STRAND

In a lot of equipment lines, old and new models will have one feature alike: small sheaves—perhaps accompanied by small drums. Either is tough on wire rope. Both should remind you to minimize their fatiguing effect by using *Preformed Yellow Strand*.

While reasonable bending is expected of unpreformed rope, severe bending tends to break down the steel itself. High speeds, heavy loads and reverse bends all hasten a premature end.

The flexibility of *Preformed Yellow Strand* enables it to hold its own longer against fatigue. Its wires and strands can concentrate on the

external bending job, because internal stresses have been virtually neutralized during manufacture. Instead of having been forcibly twisted into place, the parts have been preshaped to the spiral curvature they keep in the finished rope.

Along with greater endurance, smooth-running *Preformed Yellow Strand* offers faster installation . . . higher

kink-resistance . . . increased protection for workmen.

Specify *Preformed Yellow Strand* by name. Get all you should in wire rope performance and economy. Broderick & Bascom Rope Co., St. Louis 15, Mo. Branches: New York, Chicago, Houston, Portland, Seattle. Factories: St. Louis, Seattle, Peoria.

HAND BOOK FREE: "Industrial Wire Ropes" contains useful facts, tables, pictures. Write for your copy.

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Yellow Strand
PREFORMED WIRE ROPE

Mall
REG. U.S. PAT. OFF.

CHAIN SAW

CUTS 60 18" PILES

PER HOUR
For Chicago Contractor

5 H.P. MALL Gasoline Engine Chain Saw—
36" Capacity. Also Available in 24" and 48" Sizes.

A 15-HOUR JOB FOR 2 CARPENTERS WITH A CROSS-CUT SAW

Unskilled laborers can now cut and top piles and square heavy timbers to size with MALL Chain Saws after a few minutes instruction — at a surprisingly low cost. The 2-cycle design gasoline engine starts easily . . . has stall-proof clutch and handle throttle, and uses little fuel. The 360 degree index permits sawing at any angle. Also pneumatic models. Electric chain sharpeners are available.

Write for literature and prices.

MALL TOOL COMPANY, 7757 South Chicago Ave., Chicago 19, Ill.



Mall PORTABLE POWER TOOLS

**How to design reinforced concrete structures
based on sound fundamentals and practical
construction methods**

Here is a thorough engineering treatment of the fundamental principles of design of reinforced concrete structures, giving an understanding of the nature and properties of concrete, explaining the fundamental theories of design, and demonstrating design procedure fully with detailed solutions of many actually existing practical structures.

Just Published!

**The THEORY and PRACTICE
of REINFORCED CONCRETE**

By CLARENCE W. DUNHAM

Associate Professor of Civil Engineering, Yale University Consulting Structural Engineer for New York Engineering Office of the Anaconda Copper Mining Co., Second Edition, 558 pages, 5½ x 8½, 345 illustrations, \$4.50.

This book covers the theory and practice needed to visualize how each part of a reinforced concrete structure acts, to design these parts so that each one will perform safely the service for which it is intended, and to plan the operations in the field so that the entire work will benefit.

Features of the new edition

- emphasis on simplified, approximate methods of analysis and design
- simplified treatment of bond, showing clearly the relation between bond stresses and the bending moments regardless of the shears and direct loads
- illustrative design of a typical beam-and-girder floor system, showing sketches of the reinforcement, arrangement of bars at the junction of continuous beams over a column, and approximate methods of determining where to stop or bend longitudinal reinforcement
- treatment of combination columns and pipe columns filled with concrete
- practical suggestions for the construction of long retaining walls with varying heights
- useful material for the design of rectangular spread footings with direct loads and overturning moments
- This book gives the engineer extremely practical material in examples of design problems and constructional data taken from actual structures such as the Lincoln Tunnel, The George Washington Bridge, the Bayonne Bridge, etc., with which the author has had close association.



Look up in this book

... the chapter by W. B. Sinnickson, Engineer of Tests, Port of New York Authority, covering concrete materials, together with a detailed explanation of the manufacture, treatment, and properties of concrete itself.

--SEND THIS McGRAW-HILL COUPON--

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Send me Dunham's Theory and Practice of Reinforced Concrete for 10 days' examination on approval. In 10 days I will send \$4.50, plus a few cents postage, or return the book postpaid. (Postage paid on cash orders.)

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(Books sent on approval in U. S. only)

(Continued from page 162)

filled. Powdered graphite is used on all door locks and padlocks and openings are taped.

Station 6—All gear and winch boxes are drained. Circo degreasing unit is used on all vehicles except those that are new and have not been in ground storage. All tires, including the spare, are inflated to 10 lb. above the normal operating pressure.

Station 7—Gear and winch boxes are refilled to the proper level with the correct grade of lubricant for anticipated temperatures. The valve inspection cover is removed and cleaned and the valve mechanism is sprayed, while running, with preservative oil. The steering box is filled to the proper level.

Station 8—The entire under-carriage is lubricated and all clevis pins, yoke connections, ball joints, springs, etc., are sprayed with medium lubricating preservative oil. Care is maintained to keep oil spray away from all rubber.

Station 9—The crankcase is drained and refilled with oil engine preservative. Crankcases of diesel engines are drained and refilled with the correct grade of engine oil for anticipated temperatures. Care is taken not to flush or treat any diesel engine with rust inhibitive lubricant.

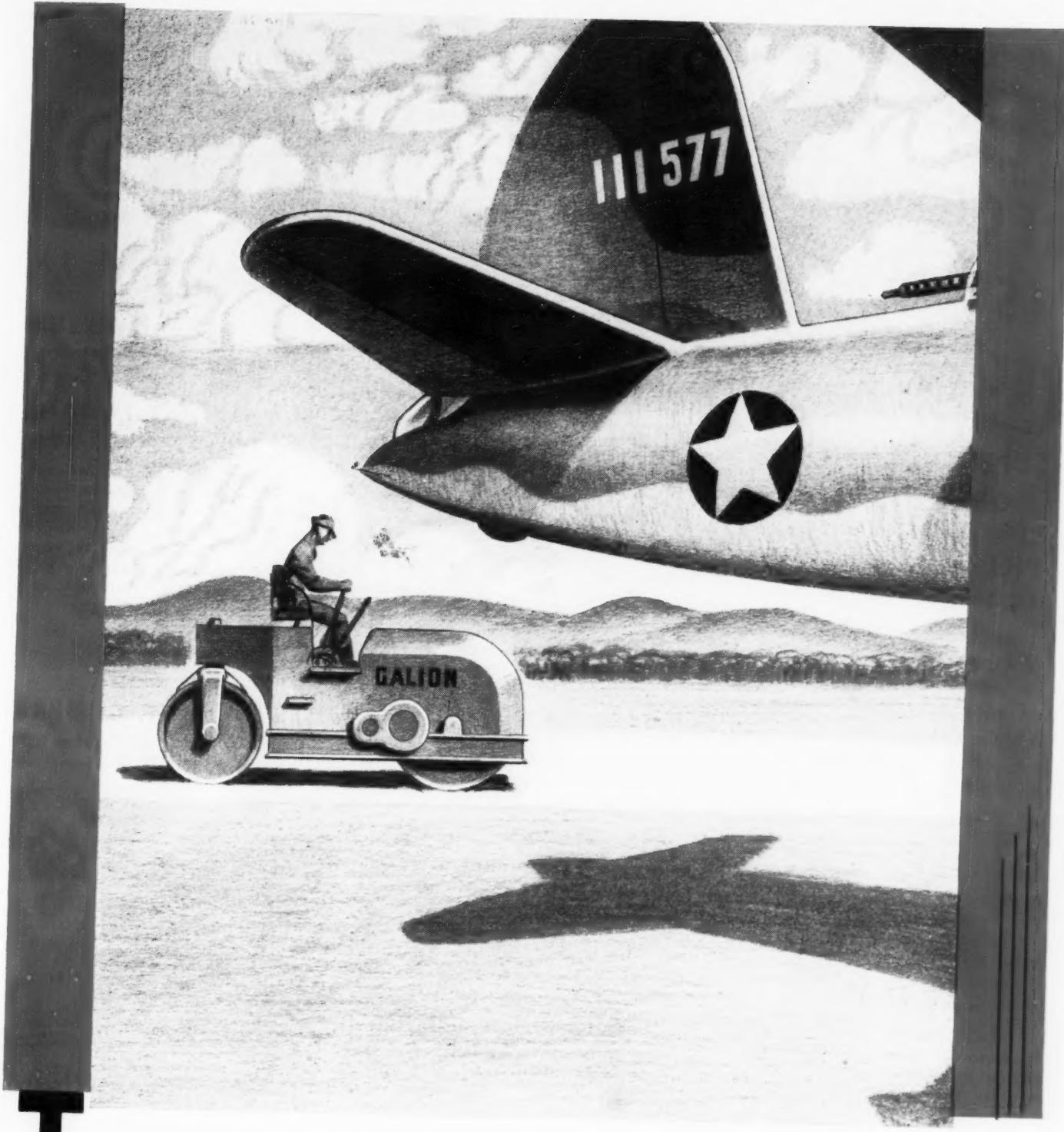
Station 10—The following parts are sprayed with a thin film of rust preventive: Entire under-carriage, universal joints, springs, wheel lugs, flanges, shock absorber bodies, linkage, upper springs, upper hardware, hinges (special attention being given to piano-type hinges), area between dual wheels, clutch and brake pedals, accelerator pedal, and other vulnerable places in the cab.

Final Processing Line

Station 1—Approximately ½ pt. of engine preservative oil is sprayed into carburetor air intake, with the engine running at a fast idle, until smoke comes from the exhaust pipe. Preservative oil is never permitted to be poured through the carburetor. The clutch is blocked out. After this operation the engine is not started again until the vehicle arrives at its final destination or has been in ground storage for a period of 4 months and must be again completely processed.

Station 2—Spark plugs are removed, inspected, cleaned, and gaged. If they are in a satisfactory and serviceable condition they are coated with engine preservative oil. If unserviceable, new plugs,

(Continued on page 166)

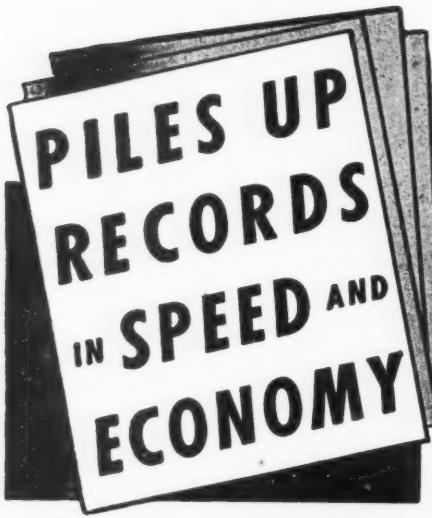


**TANDEM ROLLERS FOR PRECISE
COMPACTION IN AIRPORT CONSTRUCTION
ALSO MOTOR GRADERS**

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GALION
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Main Office and Works: GALION, OHIO

1945



**SUPER - VULCAN
OPEN TYPE
DIFFERENTIAL-ACTING
PILE HAMMERS
18C, 30C, 50C and 80C**

As piles go down under the sure, rapid, and hard-hitting blows of a Super-VULCAN, speed records pile up in all parts of the country. And, along with it go low costs because of time savings and ability of the Super-VULCAN to stay on the job.

You get twice the blows per minute—that's where a big saving in time and effort begins. Remember your Super-VULCAN uses 25% to 35% less steam per blow.

Be adequately prepared for those new construction pile driving jobs—do them at less cost — faster — easier.

The Super-VULCAN Open-Type fits same leaders — uses same accessories as VULCAN Single-Acting Pile Hammers.



•
Sizes—30C—50C—80C
meet all needs

VULCAN IRON WORKS
Since 1852
331 North Bell Avenue

Chicago 12 --- Illinois

(Continued from page 164)

properly gaged and coated with engine preservative oil are installed. While spark plugs are removed 2 oz. of engine preservative oil are sprayed in each cylinder, 3 oz. in 2½-ton and larger vehicles. When spraying, the piston is at the bottom of the suction stroke. The motor is turned over four revolutions by hand. The top of each piston is sprayed with approximately 1 oz. of engine preservative oil. Spark plugs are replaced.

Debarkation and other instructions are placed in a waterproof envelope inside the dash compartment of open cab equipment. On closed cab equipment the instructions are securely fastened to the steering column.

Station 3—Battery voltage is checked by means of a voltmeter. Electrolyte is checked and must test not less than 1.275 specific gravity with electrolyte level ¼ in. above the plates. If it is necessary to add distilled water, the battery must be charged before testing, especially in freezing weather. All battery cables are disconnected, ends taped and secured in position away from battery terminal posts, which are coated with light rust preventive compound. When it is necessary to wash the battery, a solution of 8 oz. of baking soda per gallon of water is used. A strip of wrapping paper is wrapped around all Vee belts and the engine is rotated by hand until the paper is compressed in the pulley grooves. The tension of the fan belt is reduced.

Station 4—The distributor cap is removed and the distributor plate and counter-balance are lightly sprayed with preservative engine oil. Then the cap is replaced, the vents sealed and the entire distributor sprayed with ignition insulation compound. Care is taken that a sufficient amount of the compound is sprayed around the high tension leads when they enter the distributor cap. The back and front of the radiator core and the exterior of the carburetor are sprayed lightly with preservative engine oil.

Station 5—The carburetor, distributor, coil and similar engine accessories are wrapped with No-ox-Ide Wrapper No. 4. The oil filler pipe, oil gage pipe, breather pipe, opening in the fuel pump and all vents are sealed with non-hygroscopic adhesive tape.

Station 6—The generator, horn solenoid switches, muffler, tail pipe and similar engine accessories are wrapped with No-ox-Ide Wrapper No. 4 and non-hygroscopic adhesive tape.

Station 7—The following are sprayed with ignition insulation compound: front

(Continued on page 168)



**PRODUCTIVITY METER
HOUR METERS**
give actual running
hours of engines

Specially applicable to gas or Diesel engines, these Hour Meters register the hours of operation, just as a speedometer registers mileage. They provide valuable readings that enable owners and operators to maintain motorized construction equipment at highest efficiency. Use them on compressors, mixers, graders, tractors, bulldozers.

Compact, easily adaptable . . . send
for complete details in

Catalog No. 20

DURANT MFG. COMPANY

1980 N. Buffum St. Milwaukee 1, Wis.



Steam-Detergent Cleaning

Want a fast, low-cost way to remove grease and muck from equipment to be repaired or overhauled? Then use rapid-acting Oakite steam-detergent cleaning. This time-saving technique does the job thoroughly . . . **QUICKLY** removes caked-on oil, grease and muck. And if repainting is required, steam-detergent stripping with a special Oakite material **EASILY** removes old paint . . . leaves surfaces in perfect condition for the new paint coat. FREE 24-page manual gives details.

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Technical Service Representatives Located in All
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Specialized CLEANING
MATERIALS & METHODS FOR EVERY CLEANING REQUIREMENT

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This symbol means: "Product of INTERNATIONAL HARVESTER"

It is the Mark of EXPERIENCE and SERVICE

INTERNATIONAL HARVESTER is proud that all its peacetime products are vital, basic, and essential—even in a national economy geared to war.

In these war years Harvester has also built millions of strange new precision machines that are purely implements of war. These we shall build so long as there is need.

There will be an end to them when Victory is won.

But for the things that are traditionally Harvester's, there will be a new beginning.

International Trucks, TracTracTors, Wheel Tractors, and Industrial Engines will play a major part in the making of the Post-War world. As all of these are fighting, now, on battlefield and home front, they will fight to insure a greater future for America.

Let THIS MARK—the symbol displayed here—be your guide when you have need for products such as these that Harvester builds.

It is a new mark for an old name, known to all the world—INTERNATIONAL HARVESTER.

It is the symbol of a reputation which shall rise to whatever heights the united people of America may choose to reach in their own march to the future.

This you may take as Harvester's pledge to Industry.

INTERNATIONAL HARVESTER COMPANY
180 N. Michigan Ave. Chicago 1, Illinois

OUR JOB TODAY Let's all remember that our job today—the job of all of us—is to fight harder on the home front... fight on the food front... give to the blood bank... buy extra War Bonds... fight inflation... for VICTORY.

**CHECK THESE REFINEMENTS IN
PORTABLE ASPHALT PLANT DESIGN**

LARGER FAN . NEW HORIZONTAL CYCLONE
DUST COLLECTOR . NEW TYPE SCREEN .
REDESIGNED DUCT SYSTEM —

[FROM DRYER TO DUST COLLECTOR AND]
[FROM DUST COLLECTOR TO EXHAUSTOR]

H & B
ESTABLISHED 1861

The features listed above together with other refinements in this Hetherington & Berner Portable Asphalt Plant, make for greater compactness, increased efficiency and production. Complete information on this plant will be furnished on request.

HETHERINGTON & BERNER INC.
735 Kentucky Avenue
Indianapolis 7, Indiana

WELLMAN

Williams

BUCKETS

Longer Service... Less Maintenance

Welded construction makes the difference! Multiple Rope, Power Arm and Power Wheel and Dragline buckets, $\frac{3}{8}$ to $16\frac{1}{2}$ yd. capacities.

SEND FOR BULLETIN

THE WELLMAN ENGINEERING CO.

7017 Central Avenue • Cleveland 4, Ohio
Sales and Service Agencies in Principal Cities



(Continued from page 166)

and rear of the instrument panel, entire engine assembly, including all electrical connections, junction blocks, exposed metal surfaces of engine and accessories wrapped with non-hygroscopic tape and No-ox-Ide Wrapper No. 4.

Station 8—Surfaces that will be taped and sealed, such as edges of the engine hood, cowl ventilators, louvers, rear and side-door panel are cleaned with carbon tetrachloride and then sprayed with shellac approximately 3 in. in from the opening.

Station 9—All exposed glass and the radiator front are barricaded with $\frac{1}{4}$ -in. plywood, secured with $\frac{1}{2}$ -in. steel strapping.

Station 10—All cowl ventilators, doors, engine hoods, louvers (fender and hood), and radiator barricade to engine hood are sealed with waterproof paper and non-hygroscopic adhesive tape.

Station 11—All paper and non-hygroscopic tape on exterior of vehicle are coated with sealer.

Station 12—The entire vehicle is painted with GI olive drab lusterless enamel.

In all technical equipment, such as Ordnance machine shops, photo laboratories, Signal Corps equipment, radar units, etc., a minimum of fifty 1-lb. bags of dehydrant are placed advantageously throughout the body.

At the parking area gasoline is drained and gas tank sealed. All hinges, door latches, striker plates, etc., are greased. Seats of open cab vehicles are sprayed with waterproof compound.

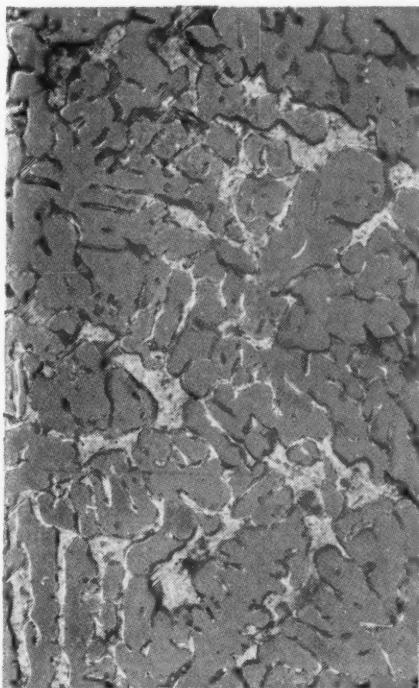
Supplementary Operations

One development originated by the Transportation Corps at HRPE that has saved much valuable time in the stowage of vehicles in ships, is the practice of placing lumber, cut to proper size for chocking that vehicle, in each vehicle before it leaves the outbound park bound for the dockside.

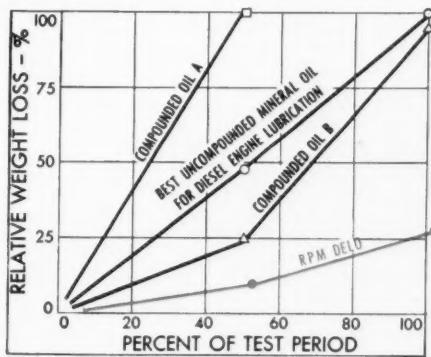
Special purpose vehicles and heavy engineering equipment that cannot be unloaded from flat cars and must be delivered by rail to shipside require processing for shipment just as urgently as other vehicles. There is also some equipment that is too heavy or too impractical to process on the ramp or run through the final processing and sealing operations. For such equipment correction of mechanical deficiencies and processing and sealing procedures are carried out by the mobile processing maintenance unit

(Continued on page 172)

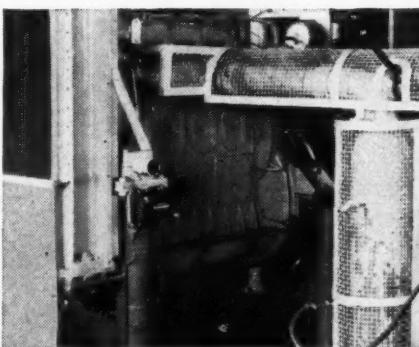
How RPM DELO Eliminates Diesel Bearing Corrosion



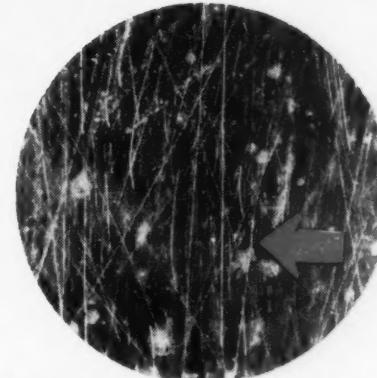
This is what happens to a copper-lead bearing when unstable lubricating oils that become corrosive, attack the lead. The picture on left shows a greatly enlarged cross-section of a new bearing, the copper in red, and lead in light grey. The picture on right shows the same type of bearing with the lead (light grey) eaten away from the surface by corrosion, leaving a copper honeycomb which disintegrates under pressure. RPM DELO Diesel Engine Lubricating Oil eliminates such corrosion of copper-lead or any kind of bearing.



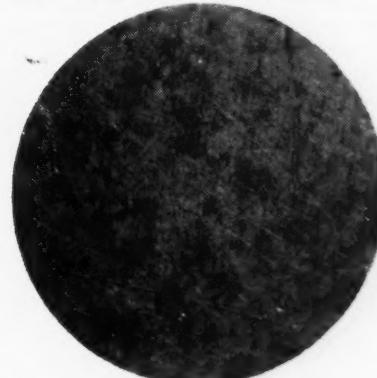
This chart shows what happens when copper-lead bearing strips are placed in oil which is subjected to oxidizing conditions at a temperature of 280°F. Note the extremely low weight loss with RPM DELO by comparison with other oils, compounded or uncompounded.



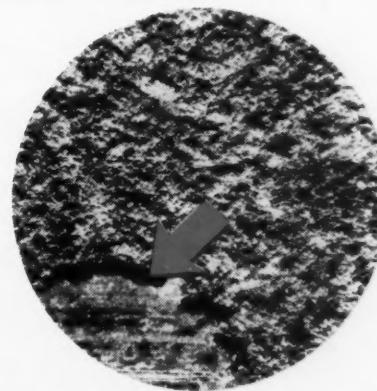
This photo shows equipment used in a 500-hour test on RPM DELO by Standard's research organization—RPM DELO has met every laboratory and field test. For specific technical information, write, asking for booklet T-2, Standard of California, San Francisco 20, Calif.



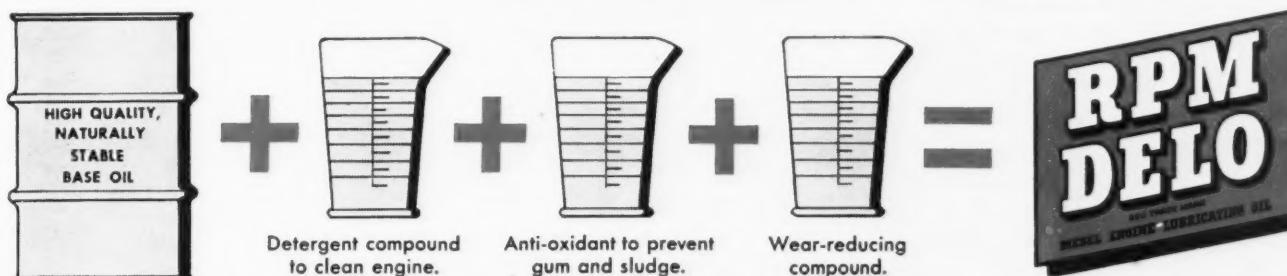
This is a greatly enlarged photograph of a cadmium-silver bearing when new. The arrow points to slight scratches from the broaching tool.



The same type of bearing is shown here, after use with RPM DELO. The bearing surface is in excellent condition.



This bearing was used with an unstable lubricating oil that became corrosive in service. Note that the entire surface is pocked and that actual breakdown is occurring on the surface. This can be eliminated by the use of RPM DELO.



STANDARD OF CALIFORNIA

RPM DELO has world-wide distribution and is marketed under the following names: RPM DELO, Caltex RPM DELO, Kysco RPM DELO, Signal RPM DELO, Sohio RPM DELO, Imperial RPM DELO

CONCENTRATE



A Right Rope for Your Every Heavy Duty Need

Preformed or Non-Preformed . . . Round Strand or Flattened Strand . . . hemp center, wire rope center or metallic core . . . Lang Lay or regular lay—whatever your needs, there is a "HERCULES" (Red-Strand) Wire Rope that will give you safe, dependable and economical service. Proof is in performance, and the consistent world-wide service record of "HERCULES" is demonstrating that

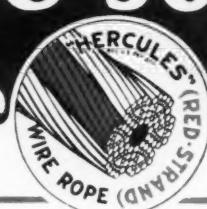
it has what it takes to meet the unprecedented demands of today. Regardless of the kind or make of wire rope you now use, it will not be able to give you the full service of which it is actually capable unless it is handled correctly and operated under proper working conditions. For valuable information on the proper use, care and application of wire rope, feel free to consult our Engineering Department.

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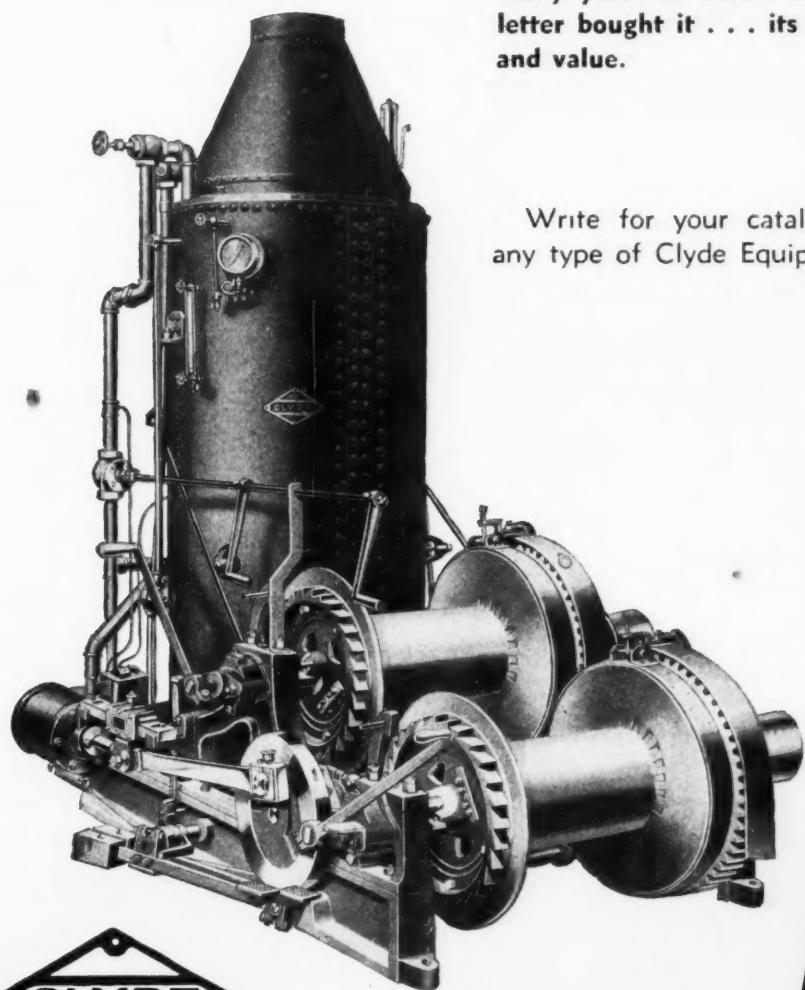
SAN FRANCISCO 520 Fourth Street
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LOW MAINTENANCE COST WITH A CLYDE

**\$26.73 MAJOR REPAIR ITEM ON 37 YEAR OLD
CLYDE HOIST . . .**

"I bought this used 2-drum Clyde steam hoist four years ago . . . since that time it has been run almost continuously. This machine has given perfect satisfaction with only a few minor repairs . . . in fact the only major item of expense incurred during the period I operated it was \$26.73 for friction blocks."

This Clyde hoist, sold to its original owners in 1908, had many years of active service before the author of the above letter bought it . . . its record is positive proof of true quality and value.



Write for your catalog on
any type of Clyde Equipment.

The
CLYDE LINE
of
QUALITY EQUIPMENT
•
HOISTS
DERRICKS
WHIRLEYS
CAR PULLERS
HAND POWERS
BUILDERS TOWERS
MINE HOISTS
WINDLASSES
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PILE DRIVERS
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CLYDE IRON WORKS, INC.
DULUTH, 1 MINNESOTA



Ingenuity in developing amazing portable docks speeded the invasion of Europe. Similarly inbuilt features of design in Owen Buckets speed up the digging and handling capacities of these popular buckets. Buy Owens for resolute operation.

The OWEN BUCKET Company
6020 Breakwater Ave • Cleveland, Ohio
BRANCHES: NEW YORK PHILADELPHIA CHICAGO BERKELEY, CAL.

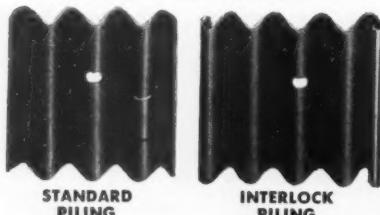


Designed for the Job! CORRUGATED STEEL SHEET PILING

If your job demands piling that is economical . . . durable . . . and easily transported . . . then Corrugated Steel Sheet Piling is the answer. It has been unusually effective when used for sewers, sewage disposal plants, coffer dams, bridges, bulkheads, and like purposes.

Corrugated is a strong but lightweight piling that is easily handled and pulled — eliminating transportation headaches by SAVING TIME, SPACE, AND LABOR COSTS. Cold rolled from open hearth steel, Corrugated is so durable it lasts for years . . . may be used again and again . . . distributing the initial cost over many jobs.

Corrugated Steel Sheet Piling comes in two types—standard and interlock. Specify one to meet your requirements. Write for catalog today.



CAINE STEEL CO.
1820 North Central Ave., Chicago 39, Ill.

(Continued from page 168)

in exactly the same fashion as that prescribed to cover ramp operations and final processing and sealing.

After processed vehicles have been loaded on shipboard, the mobile processing and maintenance unit makes a final inspection of both hold- and deck-loaded vehicles. All exposed glass—headlights, tail lights, reflectors, etc.—are blacked out. Transmission, clutch housing, and transfer case vapor vents are sealed with non-hygrosopic adhesive tape and the tape coated with sealer. The gearshift lever opening is sealed with non-hygrosopic adhesive tape and the tape coated with sealer.

* * *

World's Largest Airport

(Continued from page 79)

stead of pushes the Tournapull, has certain advantages in loose sand and comparable types of soil. A snatch-eye puller bar extending rearward from a universal attachment on the drawbar of the pulling tractor is operated by cable from the tractor's power control unit to engage and disengage a hook at the front end of the Tournapull, without manual assistance of any workman. In addition to supplying power for fast, full loading, the pulling tractor keeps the Tournapull traveling in a straight line even though one of the big pneumatic-tired driving wheels spins in the loose material. By pulling, rather than pushing, the auxiliary tractor minimizes danger of jackknifing the Tournapull unit during the loading operation.

Two types of snatch bars, illustrated by photographs, were built in the contractor's shop and mounted on pulling tractors. One type is raised and lowered by a cable leading directly to the winch of the power control unit; on the other type the control cable is reeved through a pulley block suspended from a beam-and-A-frame attachment. The first type of pullbar is fitted with side cable guys attached to the tractor drawbar. Other contractors have obtained the same effect in steadyng the pulling bar against side swing by leading the two side cables through a roller pulley on top of the pulling bar and attaching them to a single cable operated by the power control

(Continued on page 176)

Shunk
Superior Quality
BLADES
AND CUTTING EDGES

For any make of machine
Motor Graders, Main
tainers, Scrapers, Drags,
Bulldozers, Backfillers,
Wagon Scrapers, Trail
Builders, Trail Blazers,
Carryalls. Also—

CUTTING EDGES
WEARING BOOTS
BACK SLOPERS
EXTENSION BLADES
MOLDBOARDS
and
SCARIFIERS TEETH

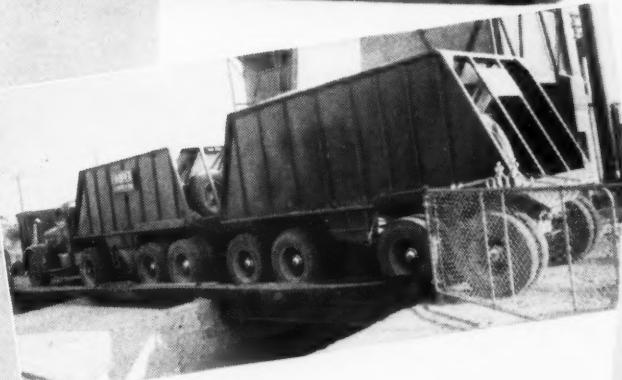
50 years of manufacturing blades has developed for you a special steel milled through our own rolls and forged at the edges to give that extra wearing quality you need.

All widths lengths, and thicknesses, punched ready to fit your machine.

Consult your internationally recognized Blade Specialists. Write for special bulletins, giving type and name of machines you operate—get set for Blades early.

Shunk
MANUFACTURING
COMPANY
Established 1854
BUCYRUS, OHIO
Member of
A.E.D.

FRUEHAUF TRAILERS handle HEAVY JOBS the Easy way!



APPLYING THE "TRAILER IDEA" to the specialized needs of the construction industry is a big part of our business here at Fruehauf.

If you're not already acquainted with Trailer operation, the "Idea" is simply this: Any truck can *pull*, on a Trailer, far more than it is designed to *carry*! That means a truck, pulling a Trailer, does *more* work . . . saves money, time and manpower. And the Trailer will usually outlast 3 or 4 ordinary trucks. Moreover, one truck and driver can handle several different types of Trailer.

Pictured here are just a few of the many different ways Fruehauf Trailers are now serving contractors, road builders and suppliers everywhere. Actually, the applications to your particular requirements are endless.

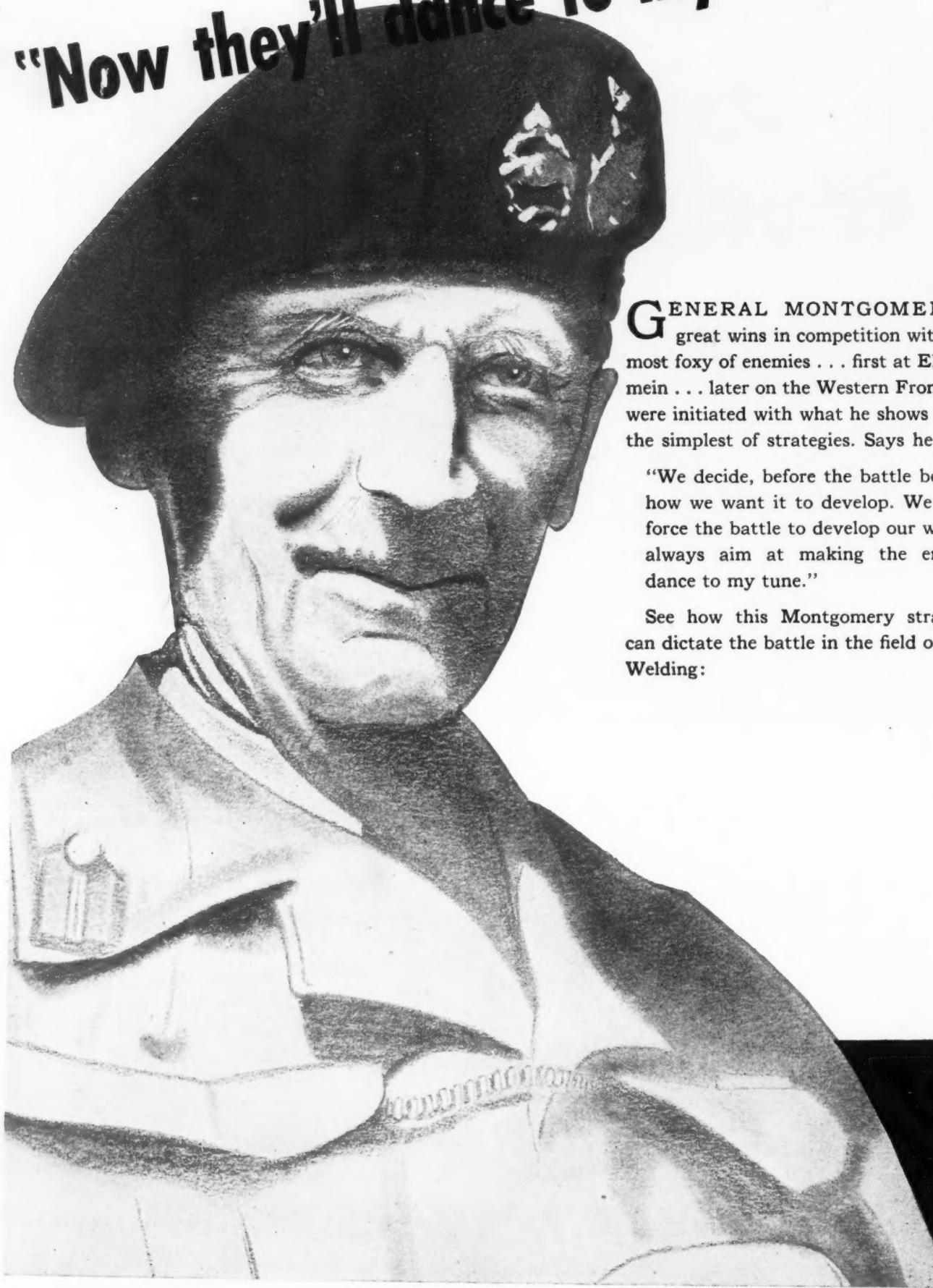
A phone call to your nearby Fruehauf Branch will put an experienced Transportation Engineer at your service. Why not call him in today?

World's Largest Builders of Truck-Trailers
FRUEHAUF TRAILER CO. • DETROIT 32
Service in Principal Cities

FRUEHAUF TRAILERS

"ENGINEERED
TRANSPORTATION"
REG. U. S. PAT. OFF.

then he said to himself
"Now they'll dance to my tune"



GENERAL MONTGOMERY'S great wins in competition with the most foxy of enemies . . . first at El Alamein . . . later on the Western Front . . . were initiated with what he shows to be the simplest of strategies. Says he:

"We decide, before the battle begins, how we want it to develop. We then force the battle to develop our way. I always aim at making the enemy dance to my tune."

See how this Montgomery strategy can dictate the battle in the field of Arc Welding:



"Force the Battle," he says

LOOK, GENERAL, how manufacturers and builders force their "enemy" competitors to dance to the tune of faster and better Arc Welding.

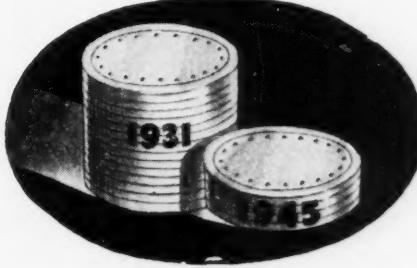
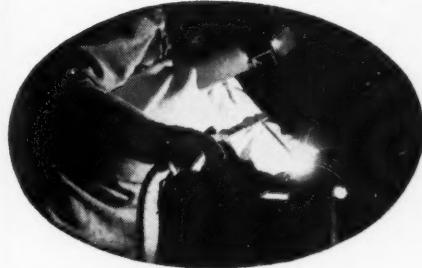
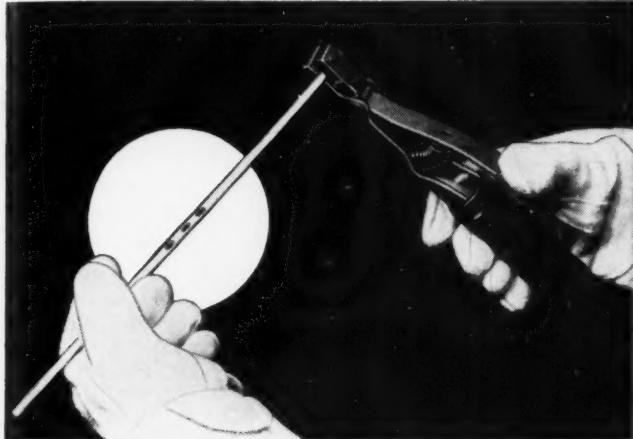
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"FLEETWELD"

. . . the world's No. 1
electrode family

THREE DOTS

Enables you to identify at a glance
the genuine "Fleetweld"



FORCE 1: FASTER and FASTER WELDING

Lincoln Engineers, in constant touch with welding users the world over, provide a fund of ideas for the continuous improvement of "Fleetweld" and the techniques for its use. Result: Deposit rates are faster; spatter and slag loss is less; arc is easier to strike and maintain under all welding conditions and positions.

FORCE 2: HIGHER and HIGHER QUALITY

Every "heat" of wire, every batch of chemicals and every step in "Fleetweld" production is checked carefully by laboratory and production supervisors to make sure that every electrode meets super strict specifications. Continuous refinement of "Fleetweld" has kept it the standard of weld quality the world over.

FORCE 3: LOWER and LOWER COST

Lincoln's increasing large-scale production has made possible installation of the world's most efficient equipment and methods for electrode manufacture. Lincoln has led the world in the reduction of electrode manufacturing cost and has continually passed the savings on to the user . . . for lower and lower welding cost.

Complete details and procedures for eight types of "Fleetweld" and 32 other Lincoln Electrodes are given in the "Weldirectory." Free on request.

THE LINCOLN ELECTRIC COMPANY • CLEVELAND 1, OHIO

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ARC WELDING

SEAL OF SATISFACTION



You can be sure of satisfactory pump performance by choosing a pump carrying the AGC rating plate. It is your assurance that the pump will deliver full rated capacity.

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**BALANCED
FLYWHEEL-FAN**

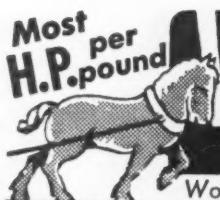
*Another
HIDDEN VALUE
IN ALL*

WISCONSIN Air-Cooled ENGINES



Every Wisconsin Air-Cooled Engine is equipped with a high-efficiency fan that is cast integrally with the flywheel. And each of these flywheel-fans is carefully balanced on a combination balancing and boring machine which accurately locates the heavy spots by means of gravity pendulum swing . . . and then takes out the excess metal, as required. Each unit is tested for smooth, free-running balance.

Just another production detail that removes a potential source of vibration and needless wear . . . right at the source! Isn't that the kind of an engine you want on your equipment?



WISCONSIN MOTOR

Corporation

MILWAUKEE 14, WISCONSIN, U. S. A.

World's Largest Builders of Heavy-Duty Air-Cooled Engines

(Continued from page 172)

unit; this arrangement allows some flexibility in sidewise movement of the pulling bar.

Hook-ups and releases are effected in the loading pit usually without stopping the motion of either the Tournapull or the pulling tractor. The Tournapull, traveling at slightly faster speed, comes up in a straight line behind the pulling tractor, which also is moving. With his hand on the clutch of the power control unit, the operator of the pulling tractor watches the approach of the Tournapull and, when the eye of the pulling bar is under the hook at the front end of the Tournapull, he raises the pulling bar to engage the eye with the hook. By moving ahead with the pulling tractor while the Tournapull operator reduces speed and drops the cutting edge of his scraper, the hook-and-eye connection is completed, and the two tractors proceed with the loading operation.

When the scraper is filled, the pulling tractor decreases speed until the eye of the pulling bar is freed from the hook. The pulling bar then is lowered, and the Tournapull rolls on its way to the dump, while the pulling tractor turns, if necessary, to hook up with the next unit.

Equipment Maintenance

Two mobile lubrication units, consisting of trucks completely equipped with oil and grease drums, compressors and hose reels, service the machines on the grading contract. Every machine is pulled out of line once each day for 17 or 18 min. for complete lubrication service. If any operating unit cannot be served during the day, the oilers come out early the next morning to give it full lubrication before it starts to work. Every morning four mechanics arrive on the job ahead of the regular crews to start and warm up the engines of all units before the operators take over.

Equipment repairs are made in a maintenance and repair shop on the job, near the center of the airport. Because of its distance from a power line, the contractor installed a Caterpillar 15-kw. diesel-electric generating set in the shop to supply electric power. During the week ending November 4, which may be regarded as typical, the equipment in operation on the contract included 13 Tournapulls, 23 crawler tractors (ten equipped as bulldozers), nine scrapers and two draglines. An accompanying illustration reproduces in part the convenient reporting form on which the engineers keep a record of contractors' equipment in operation.

For driving through soft sand to points off the haul roads in order to carry fuel, lubricants and other supplies to equip-

(Continued on page 178)



Night Shift

When the five o'clock whistle blows, it's quitting time for millions. But like as not, there's no let-up for the power shovel, derrick, or crane—and the operating ropes that are such a vital part of them.

Purple Strand Form-Set knows about that. With longer hours, with more rush jobs on the schedule, this husky preformed rope is no stranger to the night shift. 'Round the clock it's working on jobs where only the best wire rope will do—jobs that would soon bog down if the wrong kind of rope were selected.

Tough guy . . . aristocrat . . . Purple Strand Form-Set is both. Tough because it's built for the hardest service of all; because it's so highly resistant to bending fatigue, even on small sheaves and drums. And, in the wire rope "blue book," it's an aristocrat because

it's built of premium-quality steel—the finest grade that is ever used in the making of rope.

Where the going is most severe, where overtime hours make extra demands on your rope, you can depend on Purple Strand Form-Set. You'll find it a healthy, versatile rope—one that stays in service longer between reriggings.



When you think WIRE ROPE

. . . think BETHLEHEM

A DECO NOZZLE TESTER

Keeps Diesel Engines
Running Efficiently



TESTS FUEL INJECTORS
AND HYDRAULIC DEVICES
At Pressures Up To
10,000 p.s.i.

To keep diesel engines operating at peak efficiency, this portable, precision-built Adeco Nozzle Tester is indispensable.

Light in weight yet built for heavy-duty service, it enables any mechanic to make quick, accurate tests on injector opening pressure, spray pattern, etc., and detect stuck needle valves and leakage around valve seats. Tests both large and small injectors, on bench or engine, at pressures up to 10,000 p.s.i. Prevents costly delays and possible damage to engine.

Ideal for testing hydraulic devices.

Write for bulletin on this
practical, low-cost unit.



**AIRCRAFT & DIESEL
EQUIPMENT CORP.**

4411 NO. RAVENSWOOD AVE.
CHICAGO 40, ILLINOIS



(Continued from page 176)
ment units which cannot be reached by service trucks, two Dodge four-wheel-drive Army pickup trucks equipped with mud-grip tires have proved most useful. By shifting to four-wheel traction, these units can push through the softest sand encountered at the airport.

Paving Contract

Reinforced-concrete pavement 12 in. thick for the airport runways, 200 ft. wide, is designed to take a plane load of 150 tons, greatly exceeding the 85-ton fully-loaded weight of the heaviest war plane now in use. Taxiways and aprons will have a thickness of 14 in. to take care of a 25 percent increase in load allowed for engine vibration. In accordance with successful experience of the New York State Department of Public Works, the concrete mixture contains one sack (80 lb.) of natural cement, in addition to six sacks (564 lb.) of portland cement, per cu.yd. for the purpose of improving the durability and scale-resistance of the pavement. Coarse aggregates consist of two sizes of crushed dolomite from Clinton Point on the Hudson River, a large size made up of 100 per-

(Continued on page 180)

Here Is Your Nearest Worthington Distributor

For Sales, Rentals and Service
on BLUE BRUTE Portable Compressors,
Rock Drills and Air Tools.

See full page ad 4th Cover

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(Continued from page 178)

cent passing 2½-in. screen and 90 to 100 percent retained on the 1⅓-in., with the second size combining the nominal ¾-in. and ¾-in. gradations, 90 to 100 percent passing the 1-in. screen.

In starting its 570,000-sq.yd. paving contract for runways A, B and C last fall, the A. I. Savin Construction Co., East Hartford, Conn., used a pair of 34E pavers to place the concrete in two layers, one course under the welded wire reinforcing mat and a second on top of the reinforcement. These mixers handled 36-cu.ft. batches, fitting built-up compartments of Mack five-batch trucks of the Colonial Sand & Stone Co., New York, which served the two pavers from a batching plant erected on the site. Reduced to 27-cu.ft. proportions, the quantities per cu. yd. of a typical batch placed last fall were as follows: portland cement, 564 lb.; natural cement, 80 lb.; large aggregate, 1,306 lb.; medium aggregate, 872 lb.; sand, 1,158 lb.; total water, 32 gal.

Wire Reinforcement

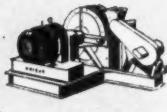
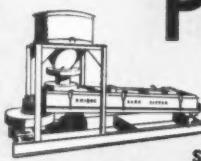
Welded mat reinforcement consisting of No. 2 longitudinal wires at 6-in. spacing and No. 4 transverse wires at 12-in. spacing is installed 4 in. below the surface of the 12-in.-thick slab. Specifications require that concrete be placed in 12½-ft. lanes, with keyed construction joints between them. The welded wire mats are made up in units 11½ ft. wide by 14 ft. long, and three mats are installed, with 14-in. laps at their two junctions, in each 40-ft. block of concrete. This length of block is marked off by the transverse joints, consisting of a 1-in.-thick expansion joint every 120 ft., with contraction joints 3 in. deep at 40-ft. spacing between expansion joints. Load transfer dowels are installed at all joint locations, both expansion joints and contraction joints. Three types of load-transfer devices for expansion and contraction joints, the Godwin, Bethlehem and American Steel & Wire, were tested in pavement placed last fall.

Experience gained last fall in placing 19,000 sq.yd. of pavement within a central section about 4,000 ft. long of runway A provides the basis of the procedure to be followed this spring, when the contractor intends to double capacity by adding a second complete paving outfit duplicating the first. The equipment in use last fall was coordinated to fit production needs. As 1,000 lin.ft. of 12½-ft. lane 12 in. thick requires 464 cu.yd. of concrete, or 348 batches of 36-cu.ft. yield, a total of 6,000 lin.ft. of Blaw-Knox 12x12-in. road forms, constructed of No. 5 gage steel nearly ¼ in. thick, was adequate to take care of the daily output

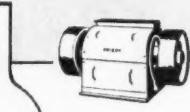
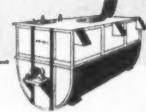
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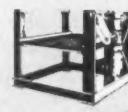


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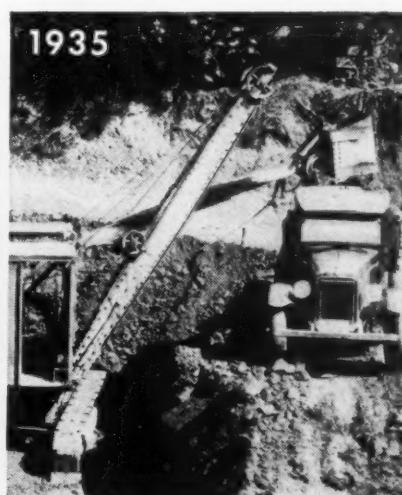
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(Continued from page 180)

of the two paving mixers when the job started.

Paving mixers traveled one behind the other outside the limits of the lane being paved. Long booms on the two pavers made it possible to reach across an intervening concrete lane to dump batches in an adjacent lane. A Ransome 34E dual-drum mixer deposited the concrete for the first 8-in. layer, which was struck off to grade by a Blaw-Knox self-propelled transverse blading spreader. After the wire mat reinforcement had been laid on top of this 8-in. course, a Foote 34E single-drum mixer placed the batches for the 4-in. top layer, which was struck off and finished by a Blaw-Knox two-screed finishing machine. This machine made two trips over the concrete, using only the rear screed on the second pass. A Koehring self-propelled longitudinal float followed the finishing machine to impart final surface smoothness in the lengthwise direction.

Concrete along the edges of the slab and adjacent to the load-transfer devices at all transverse joints was vibrated by means of a Jackson gasoline-engine flexible-shaft internal vibrator carried at the rear of the spreading machine. Behind the longitudinal float, finishers cut the transverse contraction slots by manual operation of a saw-tooth steel blade mounted in a steel beam about 14 ft. long, equipped with tubular handle-bars at each end. Water to fill the mixer tanks and to wet the sand subgrade and the burlap mats used for curing was obtained by hose connections from a 2½-in. pipeline.

Paving Progress

Specifications required that each batch be mixed for 75 sec. after all ingredients had entered the drum, with no credit for transfer time in the dual-drum paver. While training green workmen and developing a smooth operating procedure last fall, the contractor had no opportunity to utilize the full capacity of the equipment. During the first nine days, 47 percent of the time was lost because of inexperienced labor, equipment adjustments and unfavorable weather. The actual paving time in those nine days was 34 hr. In this time, the paving outfit placed 5,388 ft. of 12½-ft. lane, or 7,480 sq.yd. of pavement, equivalent to 220 sq.yd. per paving hour. Total pavement placed in the nine days took 2,502 cu.yd. of concrete, an average of 73.7 cu.yd., or slightly more than 55 batches of 36-cu.ft. yield, per operating hour.

To supply batched material to the paving mixer, the Colonial Sand & Stone Co. set up at the airport truck-loading equipment comprising a Butler bulk-cement

(Continued on page 184)



Then, I wrote a letter to the old man—

"I MUST have been just plain crazy, wanting to quit our truck operation. You were right when you said it's the best business in the world. Uncle Sam has taught me plenty about motor transport—and believe me, that's where my bread and butter are coming from when this war is over.

"I've seen what the Army is doing with military vehicles that fit the job, and common sense tells me that we can do the same thing with commercial vehicles after the war. Just think of the task to be done, putting the world back together again—and try to imagine doing it without trucks.

"Yes sir, from away over here I can see that more and more trucks are going to be needed to move an even bigger share of the nation's goods, quicker and at lower cost. I'm convinced that the best opportunity in the world for a guy like me is right back where I started. That's why I am looking forward to the time when I can come back and help build our little operation into something really big."

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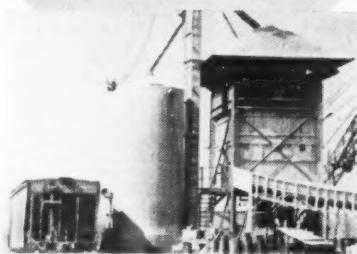
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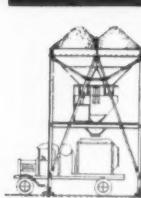
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STEP 1



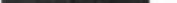
Basic 30 yard bin with 2 compartments shown at left. Next step—60 yds. with 2, 3, or 4 compartments on the right.
FLEXIBILITY? YES! Partitions change conveniently for the number of aggregates required. Centrally located cement compartment added any time.

STEP 2



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STEP 3



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FLEXIBILITY? YES!

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(Continued from page 182)

unit for portland cement, a Blaw-Knox bulk-cement unit for natural cement and a Blaw-Knox three-compartment overhead bin for sand and two sizes of crushed rock. Under the weight-batching hopper of this bin, which has a total capacity of 125 cu.yd., or 150 tons, the supplier installed split discharge spouts, suggested by John W. Davis, chief concrete technician, to deposit the aggregates at the two sides of the batch compartment in the truck, leaving a central pocket for the cement. A Northwest gasoline crane charged the bins with a 1½-yd. clamshell on a 60-ft. boom.

Tests of cylinders made from concrete deposited by the paving mixers on the subgrade have averaged 3,100 psi. at 7 days and 4,165 psi. at 28 days. Cores drilled from the 12-in. pavement and broken in a compression testing machine at an age of 28 days have shown strengths exceeding by more than 1,000 psi. the results for companion cylinders made with concrete from the same batches.

Administration

As previously noted, the new municipal airport is being built for the City of New York by the Department of Marine and Aviation, of which John McKenzie is commissioner and Elmer R. Haslett is director of airports. Design and construction of the entire project are the responsibility of Jay Downer, consulting engineer, New York, and Wharton Green, associate.

For the engineers, M. T. Decker is chief of design, and E. J. (Jack) Carrillo is field engineer. Among those assisting Mr. Carrillo at the site are Arthur F. Rogers, deputy field engineer and John W. (Jack) Davis, chief concrete technician.

W. W. Horner, St. Louis, is retained by the engineers as consultant on drainage problems. The Haller Engineering Associates, New York, are in charge of laboratory control of concrete.

Contractors who have completed or are prosecuting contracts at the airport are listed in a separate table. In charge of operations on two of the three presently active contracts described in these notes are: H. F. Schoon, general superintendent, Atlantic Gulf & Pacific Co., New York, and Proctor R. Cook, superintendent, A. I. Savin Construction Co., East Hartford, Conn. For the third contractor, the Circle Construction Corp., White Plains, N. Y., the four Riegel brothers, Augustus V., president; Arthur F., vice-president, and Edward R. and Walter J., directors, give active, personal direction to the grading job, which is under the constant supervision of Frank Donahue, superintendent, and George H. Schumacher, chief engineer.



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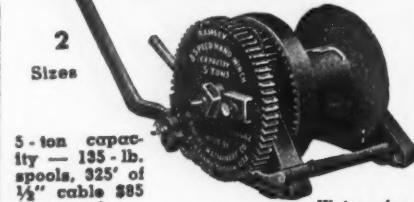
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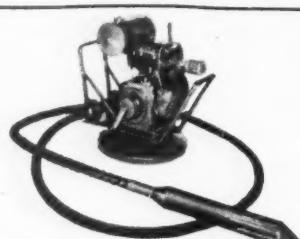
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and the sheaves are small...*



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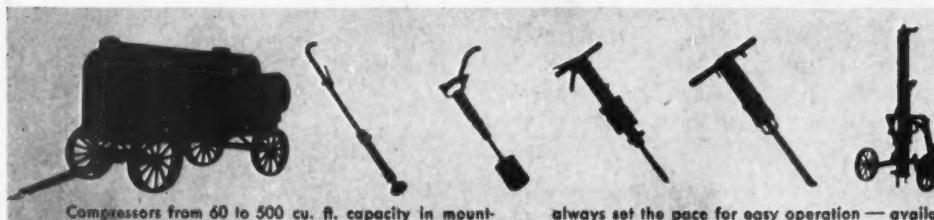
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